# THE ENGINEERING AND MINING JOURNAL

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RICHARD P. ROTHWELL, C.E., M.E.,
ROSSITER W. RAYMOND, Ph.D.,
CHARLES KIRCHHOFF, Jr., M.E., } Editors.

NOTE.—Communications relative to the editorial management should be addressed to EDITOR, P.O. Box 1833, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND P.C. Box 1465, New York. Articles written by Mr. RAYMOND will be signed thus * ; and only for articles so signed is he responsible.

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THE reduction of the price of steel rails to $35 at mill, which we announced in our last week's issue, has created a good deal of comment. To our minds, the most serious feature in connection with it is, that it throws an unfavorable light on the future rather than the present condition of the iron trade. Rails, more than any other specialty in the iron and steel trades, are ordered generally many months ahead, and the rail business, therefore, may be said to reflect, more accurately than any other, what will be the requirements of the most important consumer, the railroads. People are apt to point with satisfaction to the fact that, in the first ten months of the year, the mileage of our railroads increased 5000 miles. Unfortunately, the great bulk of all the iron-work needed for such new roads has probably long left the mills and foundries. The business they are doing at present confirms the conclusions one can not help drawing from the condition of affairs in the financial centers of the country, that the iron and steel trades can not look for much relief to the railroads and the many allied industries dependent upon them.

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LEAD producers are beginning to show alarm at the course of values, and of late there have been a good many conflicting statements as to stocks, production, consumption, etc. It has been repeatedly stated that, through the maliciously inspired reports, notably of Eastern newspapers, a very false impression has been conveyed to buyers, and that much injury to legitimate trade has thus been wrought. So far as we can judge by an impartial survey of the situation, some of the "bear" articles referred to have been exaggerated. On the other hand, it is ridiculous on the part of producers—who profess with angry vehemence that the trade is in an ideal position, and quietly sell their metal right and left—to expect their statements to be accepted as gospel. The lead trade has, during the past few months, learned how dangerous is a little knowledge in the hands of outsiders. The times have passed by when the state of a large and important industry can be wrapt in mystery, and the lead producers and refiners would do well to accept the situation and guard against future troubles by a simple measure. They should form an association, something like the American Iron and Steel Association, which in critical times gives to the public absolutely reliable data as to the statistical position, watches the course of developments here and abroad, and at all times defends and protects the interests of the industry it represents. Such an association ought not to attempt to regulate prices or production. The sorry attempts made years ago by the association at St. Louis proved how little chance there is of success in that direction.

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## MODEL MINERAL STATISTICS.

In a recent issue, we referred to the first attempt made by a department of the government, the United States Geological Survey, to collect annually statistics of the production of the mining and metallurgical industry of the country. The work, considering the circumstances under which it was done, was very well performed indeed, and, from the expressions of approval coming from different quarters, has met with much appreciation. Yet few in this country probably have any idea of the completeness to which such statistical work has been brought elsewhere. Under the circumstances, we have believed it appropriate to quote at length from the report of the Prussian Department of Mines, a simple abstract of which we have generally printed in years past. We simply tabulate the footings, to show how far the inquiry of the government statisticians extends. Beginning with coal, lignite, etc., we have the following for 1882 :

| | Bituminous coal. | Lignite. |
|---|---|---|
| Non-producing mines : | | |
| Mines in course of development | 14 | 6 |
| On account of alterations | 3 | .... |
| Hoisting waste rock only | .. | 1 |
| Stopped for other reasons | .... | 4 |
| Mines producing : | | |
| Mineral mentioned as main product | 382 | 419 |
| Mineral mentioned as by-product | 1 | 1 |
| Total production, tons | 47,097,376 | 10,798,091 |
| " " value, marks | 232,724,491 | 29,570,722 |
| Quantity used for own purposes, or wasted on dumps | 2,960,988 | 907,213 |
| Value thereof, marks | 32,927,465 | 2,633,011 |
| Marketable product, tons | 44,136,388 | 9,890,878 |
| " value, marks | 218,797,026 | 26,937,711 |
| Value per ton, marks | 4·96 | 2·72 |
| Number of persons employed, total | 171,610 | 20,108 |
| Under ground | 135,970 | 10,508 |
| Above ground, men | 32,416 | 9,258 |
| " " women | 3,224 | 342 |

In a similar manner, full details are given concerning graphite, which was mined to the extent of 38 tons ; asphaltum, of which 12,996 tons was produced ; petroleum, the wells yielding 5989 tons ; rock-salt, of which two mines turned out 210,129 tons ; kainite, which was produced to the extent of 141,272 tons ; and other alkali salts, figuring up to 553,029 tons. The iron and metalliferous mines had a record, from which we cull the following data :

| | Mines producing. | Net output dressed ore. | All men employed. | Men below ground. |
|---|---|---|---|---|
| Iron ore | 679 | 3,987,273 | 30,475 | 20,736 |
| Zinc ore | 115 | 693,369 | 12,750 | 6,976 |
| Lead ore | 121 | 155,803 | 18,562 | 10,130 |
| Copper ore | 84 | 558,850 | 12,787 | 10,966 |
| Silver and gold ore | 2 | 114 | 219 | 170 |
| Cobalt ore | 1 | 66 | 69 | 62 |
| Nickel ore | 7 | 14 | .. | .. |
| Antimony ore | 1 | 42 | 20 | 12 |
| Arsenic ore | 2 | 451 | 64 | 41 |
| Manganese ore | 23 | 4,130 | 238 | 70 |
| Pyrites | 25 | 157,960 | 827 | 454 |

The work of the salines is accounted for in a like detailed manner ; but what interest us particularly are the statistics of the production of the metallurgical works of the kingdom. We can, in our own country, boast of the elaborate and accurate figures published by the American Iron and Steel Association, and Mr. SWANK brings out some valuable features which we miss with our German friends. The following is a summary of the pig-iron statistics of the latter, which, we may add, the

labors of the German Iron Manufacturers' Association are now supplementing in some points:

| | Charcoal. | Coal or coke. | Mixed fuel. |
|---|---|---|---|
| Number of works | 23 | 77 | 2 |
| Men employed | 1,488 | 15,730 | 29 |
| Women employed | 4 | 887 | 5 |
| Output as main product | 31,623 | 2,205,571 | 2,837 |
| Output as by-product | 231 | 226,905 | 380 |
| Total product | 31,854 | 2,432,476 | 3,217 |
| Total value, marks | 3,653,309 | 145,933,838 | 215,404 |
| Value per ton, marks | 114·69 | 59·99 | 66·94 |
| *Materials used:* | | | |
| Domestic ore, tons | 76,011 | 4,748,438 | 7,727 |
| Imported ore, tons | 822 | 712,645 | ..... |
| Of total ore received in roasted form | 3,989 | 754,192 | 1,100 |
| Domestic scrap | 362 | 17,089 | ..... |
| Imported scrap | 82 | 1,660 | ..... |
| Limestone | 5,602 | 1,671,391 | 1,561 |
| Domestic cinder | 1,065 | 530,796 | 135 |
| Imported cinder | ..... | 7,331 | ..... |
| Blue billy | ..... | 7,239 | ..... |
| Miscellaneous | 108 | 528 | ..... |

Figures such as these present a better estimate of the average yield of ore in the furnace than that which was attempted some time since in England, without taking into account the scrap, cinder, etc., the use of which is now largely increasing everywhere. It is to be regretted that no effort is made to add the quantity of fuel consumed.

The statistics of the spelter industry are particularly interesting, because Germany is the most dreaded of our competitors. We therefore reproduce the figures by districts:

| | Silesia. | Westphalia. | Rhine Provinces. | Total. |
|---|---|---|---|---|
| Number of works | 24 | 2 | 5 | 31 |
| Men employed | 4,031 | 1,348 | 1,550 | 6,929 |
| Women " | 1,243 | 6 | 11 | 1,260 |
| Total product, tons | 69,846 | 13,346 | 25,089 | 113,271 |
| Domestic ore used, tons | 502,166 | 36,272 | 56,760 | 595,197 |
| Imported ores used, " | 2,202 | 2,462 | 17,971 | 22,635 |
| Including roasted ores | 45,368 | 96 | 17,066 | 62,521 |
| Other materials | 9,863 | 57 | 165 | 10,085 |
| Total ores and materials | 514,231 | 38,791 | 74,895 | 627,918 |

These figures clearly show the distribution of the enormous spelter industry of Germany. They prove how largely the Rhine Provinces are dependent upon foreign supplies. The average yield of the ores and materials worked is about 20 per cent, their percentage of metal of course being considerably higher.

We can not now enter into details as to the production of lead, which footed up to 86,811 tons of pig-lead and 2739 tons of litharge. Nor can we do more than note in passing that the copper produced has reached 14,886 tons, of which the Mansfeld District is credited with 11,724 tons. One works in the Rhine Provinces made 2019 tons of copper from 63,963 tons of roasted imported pyrites, presumably Rio Tinto stuff, and 9940 tons of domestic material, using 2140 tons of iron, 6087 tons of salt, and 1713 tons of hydrochloric acid. The product of silver of Prussia was 161,519·82 kilograms of silver and 81·74 kilograms of gold, while the yield of nickel was 121 tons. Prussian acid-works turned out 211,824 tons of sulphuric acid, using 124,241 tons of domestic and 40,144 tons of imported pyrites, and 1234 tons of saltpeter.

Special returns are made in reference to the iron industry, which we summarize as follows; leaving out the details of the furnaces running on charcoal and mixed fuel, as of minor importance:

| | Coal or coke. | Total. |
|---|---|---|
| Number of furnaces | 206 | 237 |
| Furnaces in blast during year | 170 | 197 |
| Total time of running, weeks | 8,055 | 9,080 |
| Product: | | |
| Foundry pig | 107,403 | 120,252 |
| For steel manufacture, including spiegel | 998,585 | 1,000,570 |
| Forge pig | 1,303,678 | 1,307,485 |
| Direct castings: | | |
| Machinery | 746 | 918 |
| Pottery | 403 | 6,982 |
| Pipes | 6,500 | 6,504 |
| Other castings | 10,164 | 14,885 |

It will be noted how small a proportion of the pig produced is used for castings made directly from the furnace, and how small is comparatively the quantity of foundry pig made in Germany, in spite of the fact that, as the following figures, unique in their kind, show, the foundry business is one of magnitude:

THE PRODUCTION OF PRUSSIAN FOUNDRIES.

| | |
|---|---|
| Number of foundries | 137 |
| Foundries connected with iron-works | 85 |
| Foundries connected with other works | 436 |
| Total | 658 |
| Hands employed | 25,263 |
| *Plant:* | |
| Cupolas, total number | 1,256 |
| " working | 877 |
| Reverberatory furnaces, total number | 112 |
| " " working | 89 |
| Other furnaces, total number | 280 |
| " " working | 234 |
| *Material:* | |
| Domestic pig, tons | 181,617 |
| Imported " " | 158,899 |
| Domestic scrap " | 141,222 |
| Imported " " | 6,493 |
| Total material | 488,231 |
| *Product:* | |
| Machinery castings | 195,844 |
| Pottery | 30,290 |
| Pipes | 56,193 |
| Chilled castings | 11,963 |
| Malleable castings | 5,370 |
| Miscellaneous castings | 125,320 |
| Total castings | 424,979 |

The details in regard to the manufacture of wrought-iron are similarly elaborate:

| | |
|---|---|
| Total number of works | 203 |
| Hands employed | 46,152 |
| *Plant:* | |
| Finery fires, total number | 143 |
| Finery fires working | 110 |
| Puddling-furnaces, total number | 1,985 |
| Puddling-furnaces, working | 1,614 |
| Rotary puddling-furnaces, total number | 2 |
| Rotary puddling-furnaces, working | 1 |
| Welding-furnaces, total number | 1,064 |
| Welding-furnaces working | 809 |
| Reheating furnaces, total number | 543 |
| Reheating furnaces working | 477 |
| Other furnaces, total number | 219 |
| Other furnaces working | 192 |
| *Material used:* | |
| Domestic forge pig, tons | 1,528,053 |
| Imported forge pig, tons | 13,905 |
| Loups and muck bar purchased | 101,337 |
| Scrap and old material purchased | 158,823 |
| *Product:* | |
| In finery fires, tons | 18,599 |
| In puddling-furnaces, tons | 1,389,217 |
| In other furnaces, tons | 77,704 |
| *Marketed:* | Tons. |
| Loups and muck bars | 61,907 |
| Rails | 4,228 |
| Track material | 7,136 |
| Railroad axles | 219 |
| Railroad wheels | 6,505 |
| Tires | 2,857 |
| Iron railroad ties | 26,945 |
| Fastenings therefor | 2,227 |
| Merchant bar | 326,643 |
| Fine bar | 118,802 |
| Coarse shapes | 104,425 |
| Shapes for bridges, ships, etc | 105,429 |
| Forgings | 9,845 |
| Parts of machinery | 4,735 |
| Boiler-plate | 131,805 |
| Sheet-iron, above 0·04-inch gauge | 62,095 |
| Sheet-iron, below 0·04-inch gauge | 48,161 |
| Tin plate | 10,109 |
| Wire | 239,915 |
| Tubes | 6,400 |
| Other kinds | 30,019 |

The most noticeable figures are the insignificant quantity of rails, the large amount of iron sleepers or ties, and the heavy quantity of wire, in which the German iron industry leads the world.

The details of the steel industry are of particular interest:

| | |
|---|---|
| Number of works | 64 |
| Hands employed | 27,288 |
| *Plant:* | |
| Bessemer converter, total number | 61 |
| " " working | 48 |
| Open-hearth furnaces, total number | 59 |
| " " " working | 40 |
| Crucible furnaces, for making steel, total number | 6 |
| " " " " " working | 4 |
| " " for melting steel, total number | 285 |
| " " " " " working | 143 |
| Cupolas, total number | 120 |
| " working | 90 |
| Reverberatories, total number | 22 |
| " working | 4 |
| Reheating furnaces, total number | 581 |
| " " working | 362 |
| Other auxiliary furnaces, total number | 46 |
| " " " working | 38 |
| *Material used:* | |
| Domestic pig, tons | 795,638 |
| Imported pig, tons | 120,354 |
| Spiegeleisen, tons | 130,139 |
| Ferro-manganese, tons | 5,165 |
| Wrought-iron, tons | 1,199 |
| Steel purchased, tons | 110,097 |
| Old iron and scrap, tons | 186,320 |
| Steel purchased for crucible steel, tons | 8,450 |
| Iron purchased for crucible steel, tons | 4,926 |
| *Product:* | |
| Bessemer steel, tons | 911,316 |
| Open-hearth steel, tons | 154,214 |
| Other kinds, tons | 5,096 |
| Crucible steel, tons | 36,215 |
| *Marketed as:* | |
| Billets, tons | 67,881 |
| Crucible steel, tons | 10,293 |
| Rails, tons | 479,993 |
| Track material, tons | 26,510 |
| Axles, tons | 17,846 |
| Wheels, tons | 28,871 |
| Tires, tons | 37,818 |
| Sleepers, tons | 47,116 |
| Material for sleepers, tons | 27 |
| Ordinary merchant bar, tons | 9,148 |
| Fine steel, tons | 13,673 |
| Shapes for bridges, etc., tons | 1,819 |
| Machinery, tons | 9,532 |
| Guns and projectiles | 12,176 |
| Forgings | 633 |
| Ingots and blooms | 71,388 |
| Plates | 1,350 |
| Boiler-plate | 3,241 |
| Sheet-steel | 4,341 |
| Wire | 123,532 |
| Castings | 151 |
| Other articles | 68,531 |

In all cases we have given merely the totals. The original report contains the same details for every one of the sixteen government districts, and these furnish a very close idea of the geographical distribution of the various industries without revealing private business. We do not wish to imply that it would be possible, even if it were desirable, to go into such detail in this country. We believe that it would in all cases be better to sacrifice absolute accuracy to prompt publication. A well-conducted census every ten years would be ample for all practical purposes, so far as the mass of less important data is concerned. It is humiliating, however, to be forced to confess that, so far as a large number of important industries are concerned, we have not, until this year, even made the attempt to collect them officially. It is to be hoped that in the future, figures for at least their total product will be gathered annually.

## THE NEW YORK MEETING OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

On Friday morning, special cars took the members to

### THE WORKS OF THE YALE & TOWNE MANUFACTURING COMPANY, AT STAMFORD, CONN.

The party first visited the iron and brass foundries, in a well-lighted and ventilated building, containing a five-ton Weston jib crane, the construction of which was described by Mr. Towne. Special attention was directed to the furnaces with independent draught, used for brass melting, to the brass molding from ornamental and very light patterns, and to the use of band-saws for cutting off the gates of the castings. After visiting the cleaning, pickling, and tumbling rooms, the party went to the pattern-shops, for both wooden and metal patterns, on the second floor of the foundry extension, and then entered what is known as the "Post-Office" building, from the fact that it is devoted to the manufacture of post-office equipments, chiefly wood-work. The wood-working machines are on the lower floor, and the upper floor is used for erecting. In busy times, this floor frequently contains six or eight post-offices, in different stages of completion. The metallic fronts for lock-boxes are made in the lock department and fitted to the wood-work in the "Post-Office" building. Special attention has been given to guarding against fire by the application of the overhead steam heating system in the east end of this building, and the use of overhead automatic sprinklers. Crossing the yard, the pulley-block shop was next visited. This is devoted to the manufacture of the Weston differential pulley-blocks, and the chief point of attraction is the chain-shop, in which are made all the chains used in the Weston pulley-blocks, cranes, and hoists. The smaller sizes are all made from Norway rods, and the larger sizes from American iron of high ductility. The gauges used by the chain-makers are slightly below standard pitch. After being forged, the chains are brightened by rattling, and then stretched in a special machine up to the final pitch or gauge. The strain thus applied is within the elastic limit, but has the effect of bringing the links to a permanent bearing with each other, and of giving such set to them that, when used within the intended limit of load, they will not alter their length. In this way, a chain of uniform and permanent pitch is obtained, and one having the high qualities necessary for crane work. The members were next conducted to the old "crane-shop," now fitting up for testing-machine and scale work. They were here shown a six-ton Weston hand traveling crane, which was operated and its construction explained, after which lunch was served.

After lunch, the visitors were conducted to the engine-room and boiler-house, containing a 20 by 42-inch Harris-Corliss engine, running 72 revolutions and developing about 125 horse-power; also the pit containing the hot-well, into which the condensed water from the entire heating system of the works is returned, and containing also Worthington duplex pump, Berryman heater, etc.; also a battery of six tubular boilers, built by Beach & Son, of Hartford, with patent water-fronts (dispensing with all brick setting about the fire-door), and Jarvis furnace setting, by means of which slack coal and other refuse is used as fuel, the present mixture consisting of one part of bituminous slack to four parts of anthracite pea and dust.

The party next entered the crane-shop by the gallery containing the coat and wash-rooms, from which an excellent view of the shop was obtained. The shop is 100 feet wide and 300 feet long, is divided into three aisles or bays, the center one having a clear span of 50 feet, and being used for heavy work and erecting and shipping purposes, the side aisles containing benches and light machine tools. Two Weston power traveling cranes, one of 20 tons and the other of 30 tons capacity, are in operation here, and their mechanism was explained by Mr. Towne. An exhibit of hand-hoisting appliances was also inspected. A short visit to the new —not quite completed—hammer-shop followed, and then the party were conducted successively through the small lock department, devoted to the manufacture of rim and mortise door-locks, large use being made of profiling machines; the tool-room, where special tools and appliances required in the lock department are made; and the "wheel-room." In the latter, some twenty-four men are employed in emery-grinding, and it is to be noted that the atmosphere of the room is perhaps more free from dust than that of any other room in the works. The removal of the injurious brass and emery dust is accomplished by large exhaust-fans in the basement, the peculiar form of the hoods covering the wheels, and of the orifice leading from these to the exhaust-tube, being important features.

Ascending another stairs, a brief visit was made to the plating department, the first room of which contains the acid and soda-tanks, etc., the second the buffing-lathes for polishing by means of rag wheels, and the third the plating appliances, including the depositing-tanks, dynamo-machines, etc. Leaving the plating-room, the party entered the room in which the 75-ton Emery hydraulic testing-machine is temporarily erected, and where a short series of tests of materials was made in the presence of the members. The testing-machine is similar in general principles to the 400-ton government machine at the Watertown Arsenal, but is of the upright type. It has a straining capacity of 151,000 pounds, applicable to tests of tension, compression, and transverse loads. It will receive specimens for tension up to 74 inches in length, and for compression up to 88 inches in length, with ample allowance for elongation. The supports for transverse strains can be separated 84 inches, and specimens of any length can be inserted. The construction and action of the machine were explained verbally during the process of making the tests.

### THE EVENING SESSION.

After a brief discussion of the plan proposed to elect the officers of the society, Mr. C. J. H. Woodbury presented a lengthy paper entitled

### EXPERIMENTS UPON NON-CONDUCTING COVERINGS FOR STEAM-PIPES,

giving the details of tests made by Professor Ordway, for the Boston Manufacturers' Mutual Fire Insurance Company. We may have occasion to refer to this paper at some future period. Suffice it to say, that its conclusions were attacked on the ground that these were not carried out on a larger scale, and by methods more closely approximating actual practice. Mr. Emery held that even their value as giving comparative data was open to doubt, and he gave some interesting figures to show how small the condensation was in four miles of the pipe, two thirds of it over 15 inches in diameter, of the New York Steam Heating Company in this city, the underground pipes of which are covered with mineral wool.

Mr. E. D. Leavitt, Jr., consulting mechanical engineer of the Calumet & Hecla Mining Company of Lake Superior, cited the fact that at those mines 8-inch pipes more than five hundred feet long were used to carry steam from the boilers to the engine. Formerly, when laid in a simple launder, the condensation in them amounted to several hundred gallons per hour. He covered the pipe with a mixture of plaster of Paris and sawdust, costing approximately 12½ cents per square foot. Before the covering got dry, the condensation increased; but when once thoroughly dry, it decreased until it was less than one per cent of what it had been before. This kind of covering was first introduced by Chief-Engineer Isherwood at an iron-works in Baltimore, where, with 1 inch of hair felt over it, there was a decrease of 95 per cent of the condensation. Mr. Leavitt now applies it for boilers generally, putting on a 2½-inch layer of a mixture of one part, by volume, of plaster of Paris, and two parts of saw-dust, made into a mortar, and putting above that a 1½-inch layer of felting, and in spite of the fact that at the Calumet & Hecla the temperature runs below zero only a few feet from the boilers, there is no noticeable increase in the quantity of fuel consumed, in summer or in winter.

By special request, Professor Thurston gave a brief abstract of his paper on the Theory of the Turbine, lack of time preventing a thorough consideration. Professor Hutton, the secretary, then read the following papers by title, Motive Curves for the Slide-Valve, by A. W. Robinson, and Compression as a Means of Governing Engines, by Harris Tabor. Before adjournment, the customary resolutions of thanks were offered.

On Saturday, the members, by invitation of the New York, West Shore & Buffalo Railroad, took a trip over the road to Kingston, N. Y., inspecting the exceptionally extensive terminal facilities at Weehawken, and the generally high character of this new road, which has had to contend with so many engineering problems in its construction.

## A NEW GLOSSARY OF MINING TERMS.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: At first thought, it would seem that this field had been so often gone over and so fully ransacked that little room was left for a fresh compilation. But a glance at the new glossary published in the Report of the Director of the Mint on the Production of Gold and Silver in the United States for 1882 (pp. 753–763) will show that such a view is erroneous. This contains much that will be novel to mining men, and many of the definitions are so strikingly original that it is worth while to append some of the best:

"ADIT-LEVEL.—A tunnel driven for effecting the general drainage of a mine, being designed to receive and carry off the water, both above and below its level."

"ALLUVIAL [*sic*].—Deposits of mud, sand, gravel, etc., made by running streams, more especially the deposit left along their banks during high water."

"AMALGAMATION.—The process by which metals are separated from their ores by mixing them with mercury."

"APRON.—A canvas-covered frame set at such an angle in the miner's rocker that the gravel and water in pouring over it are carried to the head of the machine." No reference to the aprons of gold mills.

"ANTICLINAL.—The line of a crest above or underground, on the two sides of which the strata dip in opposite directions."

"ARRASTRA.—A Mexican contrivance for crushing and amalgamating ores by means of a heavy stone dragged around upon a circular bed." This single-drag apparatus is something rare.

"BAR.—A band of hard stone or rock crossing a lode."

"BASE METALS.—The metals not classed *as valuable* or precious." Not copper? Nor lead?

"CAGE.—A *box* or platform used for hoisting in a vertical shaft."

"CAP.—A vein is in a 'cap' when it is much contracted."

"CAP-ROCK.—The uncertain upper rock that covers the older bed-rock."

"CHILIAN MILL.—An improved arrastra, in which a heavy stone wheel is rolled around the circular bed." How about the iron ones?

"CREVICE.—A narrow opening resulting from a split or fissure." Or from a fault?

"DAMP—BAD AIR.—Choke-damp; fire-damp."

"DEPOSIT.—Mineral deposit, or ore deposit, is used to designate the natural occurrence of mineral or ore sufficiently rich to warrant its being worked."

"EPIDOTE.—A mixture of alumina and silica forming a variety of granite; often of beautiful color and shape."

"ERUPTIVE.—The name given to rocks that have burst through other rocks in a molten state, *or that have been thrust up bodily.*"

"EXPLOSIVES.—The explosives used in mining are gunpowder, *nitro-glycerine*, dynamite, etc."

"FEEDER.—A small vein joining a large one at nearly right angles."

"FIRE-DAMP.—Light carbonated hydrogen gas. . . . "

"FISSURE-VEIN.—A fissure or crack in the earth's crust filled with mineral."

"FLOURING.—The covering, in the course of using, of the globules of mercury used in gold" [and silver?] "extraction with a thin film of the sulphide of some other metal by which the gold" [or silver?] "is lost; sometimes called sickening." The compiler evidently does not believe in mechanical flouring.

"FLUME.—An artificial water-course."

"FLUX.—Any substance that is favorable to fusion, oxidation, or reduction by fire." Wax?

"FREE-MILLING ORE.—Ores in which the precious metals are free from combination with other substances, and can be reduced by crushing and amalgamation without roasting or chemical treatment." Horn-silver, argentite, etc., should therefore be roasted or subjected to "chemical treatment."

"GALENA.—Sulphide of lead; the ordinary lead of commerce."

"GRIZZLY.—A grating to catch and throw out large stones from sluices." Not used in mills, apparently.

"GROUND-SLUICE.—A long box with suitable chinks for retaining the gold, used by gravel miners for washing away large quantities of auriferous *débris*."

"HEADING.—The under side of a lode or vein above a drift."

"HORN-SILVER.— . . . So called because it has a horn-like surface."

'HORSE.—The dead or barren rock or ground by which a vein is sometimes split horizontally into two."

"HUNGRY.—Hard, barren vein matter, *like quartz*."

"IN PLACE.—An ore-deposit occupying the place in which it was originally found."

"LEVEL.—A horizontal passage or drift into or in a mine."

"MATTE.—The product of the first incomplete reduction of an ore."

"MILL.—Works for reducing ores by other means than smelting."

"MULLER.—The iron shoes dragged around in an amalgamating pan to mix and further pulverize the pulp."

"NODULAR.—Having a blistered appearance . . . "

"ORE.—The parts of a vein containing a useful or salable metal."

"PAY-STREAK.—In placer mining, a rich strip of gold-bearing gravel."

"RIFFLE.—A *groove* in the bottom of a sluice to hold the quicksilver and catch the free gold."

"ROASTING.—Ores submitted to the action of flame until sulphurous and arsenious fumes cease to be given off."

"ROCKER.—A long sluice-like box for washing away gravel from gold by cradle-like rocking."

"ROCKING.—The process of separating ores by washing on an incline plane."

"SCREEN.—A sieve of wire-cloth or perforated sheet-iron, used to sort ore according to size."

"SHAFT.—A pit, or well-like excavation, sunk from the surface."

"SLAG.—The melted gangue from furnace smelting and assaying of ores."

"STOPING.—Excavating ore from a vein by driving horizontally upon it a series of workings, one immediately over or under the other."

"SUMP.—A pit sunk from the bottom of a mine, either to probe a ledge or collect water."

"TAILINGS.—. . . or what passes away from reduction-works after any systematic treatment."

"TUNNEL.—A level driven at right angles to the vein which it is desired to reach."

"UNDERLIE.—The departure of a vein or stratum from the vertical."

"VEINOUS.—Rock or matter from the vein, and not 'bed-rock' or 'country.'"

"WATER-COURSE.—An artificial channel for passage of water."

The compiler has exercised a critical selection of terms, introducing such obscure names as cañon and gulch, yield and output, alloy, anneal, assay, caved, crushing, ingot, etc., and carefully omitting all lingo common to the tender-foot; as, for example, skip, skeet, whip, compressor, blower, fan, reel, drum, sheaves, gallows-frame, baby-hoist, cable, Cornish pump, water-jacket, speiss, pan, settler, agitator, table, sluice, slime, giant powder, exploder or cap, fuse, slickens, names of rocks and ores, etc. This feature adds to the convenience of reference. We note with sorrow, however, that the printer has taken liberties with some of the definitions. Thus batea appears as "bateau," a fault is described as a "discoloration," hose becomes "horse," etc. It is too bad that typographical errors should be allowed to mar the beauty of this unique work. ‡

## AMONG THE IRON WORKERS.—JOHNSTOWN.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: At Altoona, I asked a Johnstownian about the hotels I would find at his native place, and his description I afterward found to be too true. "There are but two hotels of any pretensions," said he, "and whichever one you go to, you will wish that you had taken the other." Thus encouraged, I sought out the Merchants' Hotel, when I reached Johnstown on Saturday evening. At the station, I asked for directions to take me to mine inn, and with rather a vague idea, I started out to follow them. Their want of definiteness, however, soon became too apparent, and I had to apply to a young traveler for further information. After getting the desired directions, I asked the young fellow if this were not the best hotel, and had my purpose well-nigh upset by his answer, "No, indeed, the other is much better;" and not content with directing me thither, he started out to accompany me. It struck me that such unusual attentions might not be disinterested, so I thanked my would-be guide, and said that I would first get my mail and search for a hotel afterward. He proved the kindness of his purpose, however, by taking me to the office, and, having given me very full directions, he bowed himself off. Though the Merchants' fulfilled its description entirely, yet I was not sorry that I had carried out my original intention; for at the supper-table, I was fortunate in finding an old college friend; and the circumstances of our meeting added greatly to the pleasure of my visit.

The life of Johnstown, and indeed almost the *raison d'être* of its existence, is the Cambria Iron Company. The city itself is rather complex in its organization. It includes several neighboring boroughs, and in all boasts of something like eight thousand inhabitants. Its location is rather peculiar. In the very heart of the mountains, the town-site is nearly level. On all sides, the town is surrounded by steep hill-sides; and in this lies its peculiarity that, when one reaches the top of the hills, instead of finding corresponding valleys on the other side, he finds simply an elevated table-land, on which many productive farms are located. The city seems to be situated in a marked depression of an otherwise level plateau. The streets of the place have no gradual changing to steep grades, but are beautifully level until they seem to terminate against the steep hills. The town has shared the success of its great company. With the growth and prosperity of their furnaces and mills, the Cambria people have done much to improve the locality. The company's stores, run under the name of Wood, Morrell & Co., the original projectors of the iron-works, are themselves a substantial monument to the business importance of the place. I was told that in one month the sales amounted to $93,000—a goodly sum for a place of this size; but, as a rule, the miners and iron-workers are an improvident set, and enjoy their money while they have it. This accounts, in a measure, for the enormous sales of a store which must compete with many other well-stocked houses. It is, perhaps, an unequal competition; for, while the laws of the State forbid manufacturing and mining companies from paying their employés in merchandise, yet, in most cases, some pressure is brought to bear to influence the workmen's choice of stores. Adjoining the stores, one finds a large, substantial brick building, and on inquiry is told that it is the general offices and drawing-rooms of the company. On the opposite side of the street, another large brick building attracts the attention; it is the library erected by the company for the use of its employés and the townspeople generally. Its architecture and general appearance proclaim it to be a new structure; and if it fulfills the promise of its exterior, the Johnstownians can have no lack of good reading matter. It is a noticeable and very pleasing fact in all these industrial towns to see the pains the large companies are taking to furnish every incentive to their workmen to educate and cultivate themselves; and both by libraries and night-schools, the good work is helped along. At Johnstown, certain evenings in the week are devoted to lectures on various subjects of educational interest. Thus, the assistant mining engineer lectures on geology, another gentleman on astronomy, perhaps, and so on. The time seems finally to have come when capitalists recognize the importance of intelligent workmen, and, joining philanthropy and self-interest, they are making earnest efforts for the improvement of their employés. A few squares from the library, another building of no small pretensions is found in the Cambria Club-House, which addresses itself to the more material wants of Cambria's richer workmen. A few years since, and the visiting president and directors of the company had, in the absence of any decent hotels, to be accommodated at the house of the general manager; but since the gentlemen came once a month and staid several days on each visit, it became necessary to provide some more extensive quarters than could be demanded of individual hospitality, and so the Club-House was built to meet this requirement. Its advantages are, however, open to the company's employés, and to any strangers procuring cards of admission from officials high in authority. Unfortunately, the prices, ranging from thirty to sixty dollars a month for room and board, are beyond the means of most young men whom it would benefit—those coming from comfortable homes, who are ill prepared to be content at a country hotel or provincial boarding-house. The building is quite modern, having gas and electric bells, and is furnished in a modestly artistic style. The rooms are gems of their kind, having large windows, open grates, and Queen Anne furniture. On the whole, the entire building, inside and out, gives one the impression of being a well-kept, comfortable sort of place.

Nor is the town devoid of amusements. Though the largest building, Union Hall, affords but meager accommodation, in either auditorium or stage appointments, it is made the most of, and many a strolling dramatic company lures the half-dollar necessary for admittance to the "show" from the open pockets of the too careless workmen. At the time of our visit, Miss Pixley was in town, and with her company gave *M'liss* at the Hall. The performance was highly appreciated, the applause being quite uproarious at all sensational situations. The heavy villainy and wholesale display of revolvers particularly pleased the fancy of the iron-workers.

Not less conspicuous among Johnstown's buildings are her churches. A stranger is surprised to see such roomy and substantial structures. All denominations seem represented, and, from the size of their buildings, are apparently well patronized. Sunday morning finds quite a change in the town. The noise and bustle of the week are hushed, and the works, except the blast-furnaces, are at rest and silent. The Episcopal church, one of the prettiest in the place, gathered a very fair congregation to hear the discourse of her bishop. In the evening, we went a second time; but on account of the administration of confirmation, the church was greatly crowded, and we turned away to attend a neighboring service. We were somewhat amused to find the sermon about half over, but understood the cause when we afterward learned that the hour was a half earlier than in our own church.

With Monday morning, the stir and bustle of the place again manifested itself. Mills and shops were again in operation, and the town reverted to its condition of the previous week—that of a huge factory. Steel rails form the chief product of the company's works. The rail-mill is a long, low building, that presents many interesting features to a stranger. After watching the production of the pig-iron from the ores in the great blast-furnaces, and having seen the change of the pig metal into steel in the huge Bessemer converters, the last chapter in the transformation, the shaping of the steel into rails, is no less interesting. As carried out at present, the large ingots of metal, as they come from the converter, are heated to whiteness in furnaces, and having been rolled out into long bars, are cut into lengths such that each will form one rail. These smaller ingots are again reheated, and are now ready for the rolling-mill proper. Eleven times does the steel ingot pass through the rolls before it attains the proper shape for a rail. The mass of red-hot metal is first rolled into a short stout bar, then into a thinner but longer one, then into an approximation to the rail shape, and so on through the gradual changes, until it emerges into the perfect rail. But the process is not yet ended: for the rail ends are still ragged and uneven, and must be cut down to a smooth section and uniform length. To accomplish this, the rail, still red-hot, is brought before two parallel circular saws, revolving at great speed but without teeth. The distance between the saws being of the length desired for the rails, both ends are cut at once and the rail passes out to the cooling platform. Here small iron arms receive the rails, and placing them side by side, give to each a slight curve to allow for contraction. Were they left straight, they would be found to have a decided curve when cold, since there being a greater mass of metal in the head than in the flange, the contraction would be greater in the greater mass, and the rail would be found in a curve, with the flange on the outside. Hence the red-hot metal is curved with the head on the outside of the circle, so that when cold the rail shall be perfectly straight. When quite cold, the rails are further passed through another machine, so that any irregularities may be corrected, and the product be of perfect form.

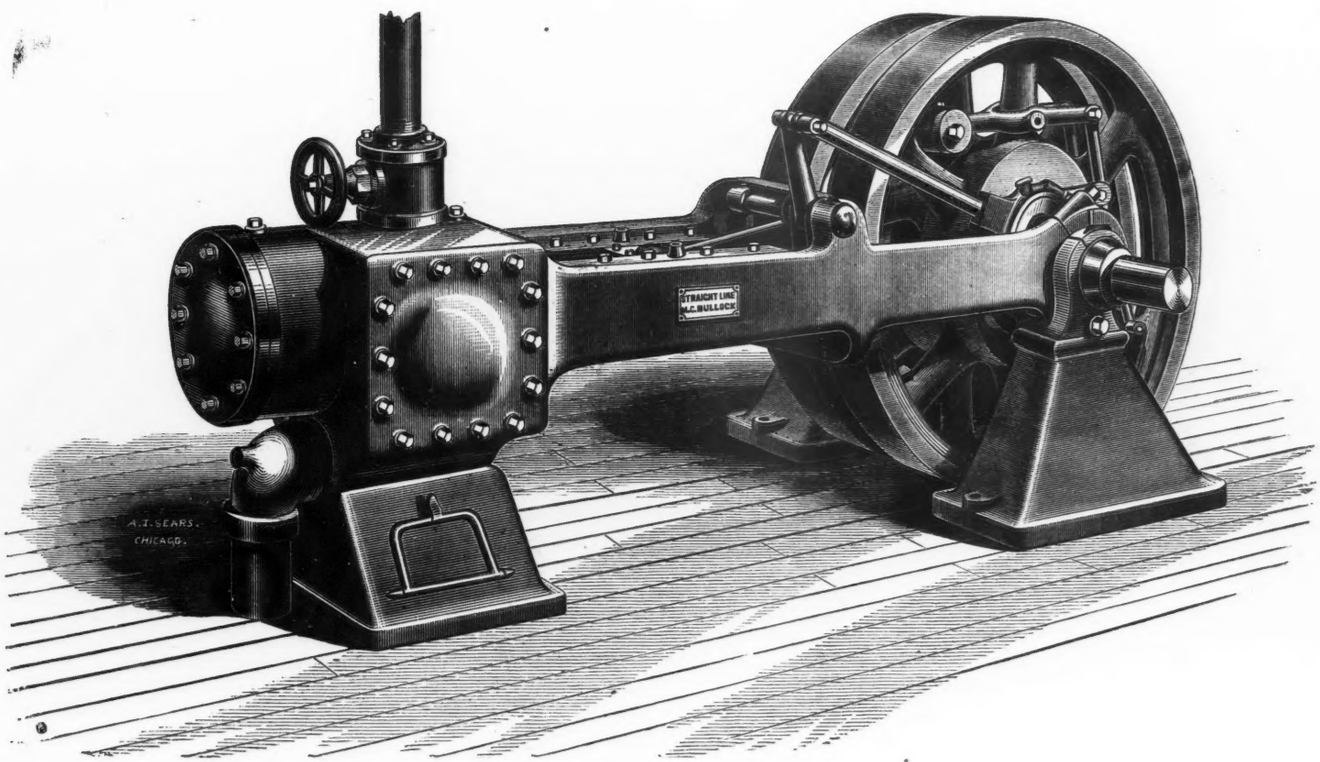
Johnstown had many other objects of interest in the way of mines, wire-mills, and coking-ovens, at which we could take but a glance, and proceed on our pilgrimage; the Mecca of our trip being, in this case, Pittsburg.

CARL.

## THE STRAIGHT-LINE ENGINE.

We place before our readers illustrations of the straight-line engine, including special cuts of the latest improvements in the minor details which have never before appeared in print. The engine, as will be seen by an examination of the various engravings, differs in nearly every essential feature from all other engines heretofore brought out; and from the character of the design or the motto that we find on one of the circulars of the builders, "A straight line is the shortest distance between two points," we infer the name "straight line" was evolved.

The two sides of the frame run in straight lines following the lines of strain from the cylinder to the main bearings, and the frame, jacketed cylinder, steam-chest, guides, main bearings, etc., are cast in one piece and rest on three self-adjusting supports. All the lines in the design are straight, with curved ends, and all the sections rectangular, with rounded corners. While in its articulating and rotating elements there is very little that is essentially different from the modern horizontal engines, constructively each point has been a study in itself. The piston is very long and light, as shown by the section Fig. 1, and is secured to the rod by the double taper central thread and a shrink fit. The packing consists of four eccentric cast-iron rings sprung into grooves, and prevented from working around in the manner shown in Fig. 2; *A* being the piston, *B* the rings, and *C* filling pieces tightly driven in




THE STRAIGHT-LINE ENGINE.

the grooves. The joints between the ring and filling pieces are cut in such form that the expansion and contraction of the rings does not open a passage for steam between the two. The packing pieces are placed on the bottom of the piston, and dressed smooth, restoring the wearing surface to its full extent. The pistons are deeply recessed, to admit of the long Babbitt bushings which serve as the piston-rod packings *D*, Fig. 1. These bushings are self-adjusting, by the ball-and-socket and sliding joint, so as to conform to the position of the piston-rod, and are steam-tight when the engine is running, while they are four one thousandths of an inch loose on the rod. This is due to the length of the bush, the steam not having time to insinuate its way through the narrow opening during the time the engine is making a half-revolution. The piston-rod is secured in the cross-head by being threaded in between two half-nuts and the half-nuts clamped on the thread by binding screws. The cross-head pin is made fast in the connecting-rod by a clamp-bolt, and turns in the cross-head, giving two bearings in the place of one, as usually employed, with the advantage that the journals can be oiled with perfect convenience. The pin is of hardened steel, ground and polished, and turns in Babbitt bearings with effective compensating wedges and screws. The connecting-rods, Fig. 7, are of cast-steel, 6¼ cranks long, and grasp the crank-pins more than one half the diameter of the cylinder in size and of a length equal to about one third the stroke of the engine. These crank-pins take direct hold of and join two fly-wheels. These wheels may be used for driving belts, or pulleys may be placed on the ends of the shafts, which project through the side frames for that purpose. (See Fig. 3.) The crank-pins and shafts are of steel, ground and polished in their bearings, and turn in compressed and scraped Babbitt-metal boxes.

One of the fly-wheels carries the governor, Fig. 4, which consists of a single governing weight, a single spring connected by links to a single shifting eccentric. The eccentric has cast with it two projecting arms, one being pivoted to the fly-wheel and the other attached to the governor. The weight of the governing ball is such as to just counterbalance the weight of the eccentric and its attachments against gravity: but the center of gravity of the weight being farther from the center of rotation than the eccentric, the weight being heavy, rotating in a large circle and at a high velocity, gives it high governing power. All the pivots subject to heavy strain are anti-friction journals, flat pieces of hardened steel rolling on round pins, giving rolling in the place of sliding contact, and requiring no oil.

The eccentric plate is pivoted in such a position that the engine when taking steam at three-quarter stroke has a positive lead; and when cutting off shorter, the lead changes to zero and negative lead, as the cut-off grows shorter and shorter.

One of the most novel features of the engine is the valve motion, which, though consisting of the ordinary rock-shaft arrangement, is so proportioned that the lead varies alike at each end of the cylinder, and the cut-off is practically alike at each end at all points of cut-off. This is accomplished by the position of the upper rocker-arm, which is at an acute angle with the eccentric-rod, as shown by the diagram Fig. 9. By this arrangement, the eccentric can be shifted when the crank is on either dead-center from its greatest to its least throw, without giving motion to the valve, if it is desirable to provide for a constant lead; or so as to give equal motion to the valve at each end when a variable lead is required. The rocker-arm is of ordinary construction, except that the lower arm is forked so as to take hold of each side of a sliding block which works in jaws on the end of the valve-rod, Fig. 5. The valve-rod works through a long Babbitt bush, which is secured in the frame of the engine by a taper fit and nut. The adjustable coupling on the valve-rod hooks into lugs cast on the valve in such a way that the valve may be removed without disturbing the adjustment. The valve is a flat slide working between a cover-plate and the valve-face, and distance-pieces between the valve-face and cover-plate above and below the valve, three or four one thousandths of an inch wider than the thickness of the valve, receive the full pressure of the steam on the cover-plate, allowing the valve to play free and yet practically steam-tight. Valves of this character were used in England years ago, and proved defective from two causes: First, the pressure-plates were too light, springing down and grasping the valve under high-pressure steam, and away from the valve and leaking under low pressure; and secondly, the exhaust steam issuing from the ports cut away the opposite faces on the cover-plate. In these engines, shields are cast in the valves, to protect the cover-plates from such action, and the cover-plates are made so strong that steam pressure does not spring them beyond the limit of clearance.

The throttle-valve is a disk rotating on a circular face, both the disk and face having a D-shaped opening on one side and a D-shaped recess in their faces opposite. When the two holes coin-

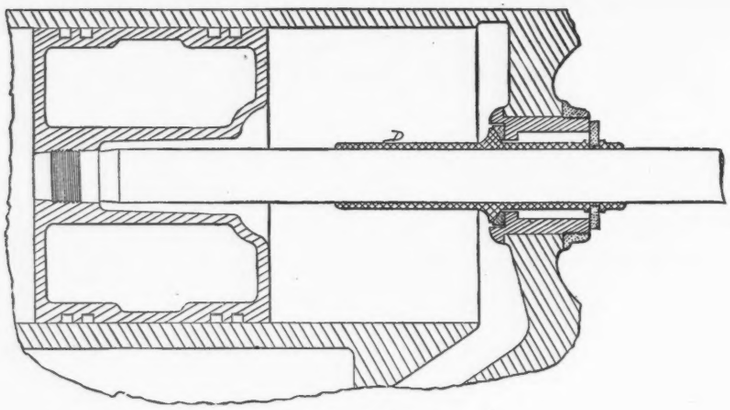


Fig. 1.—Piston.

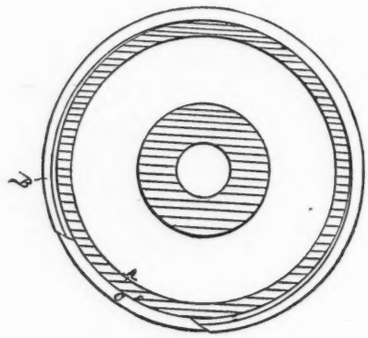


Fig. 2.—Piston-Rings.

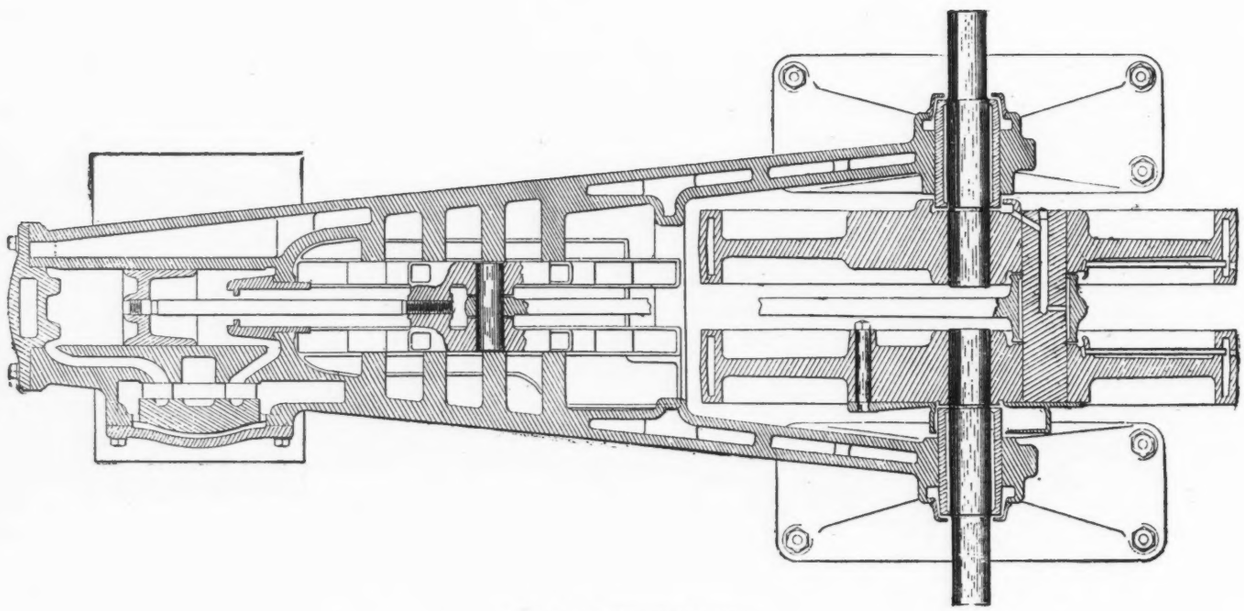


Fig. 3.—Horizontal Section.

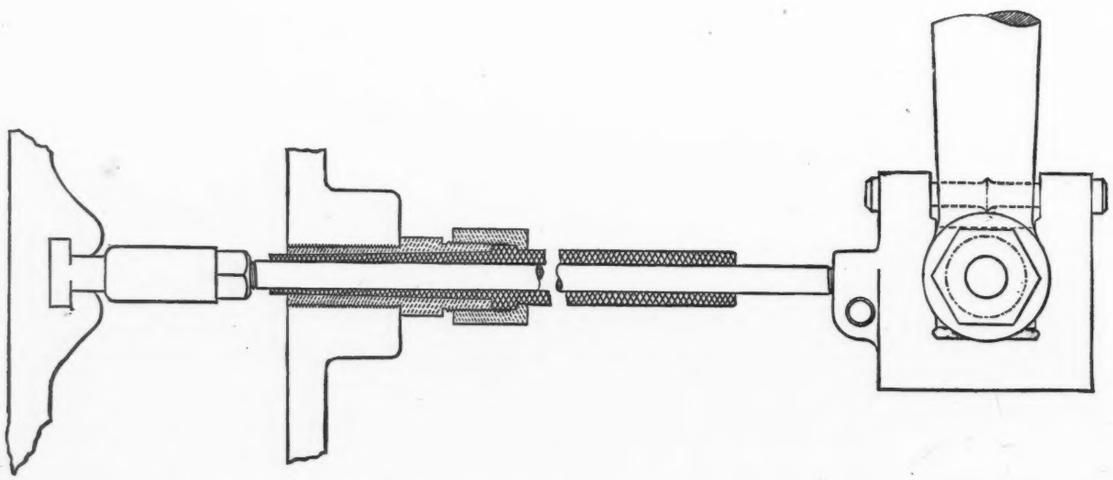


Fig. 5.—Valve-Rod.

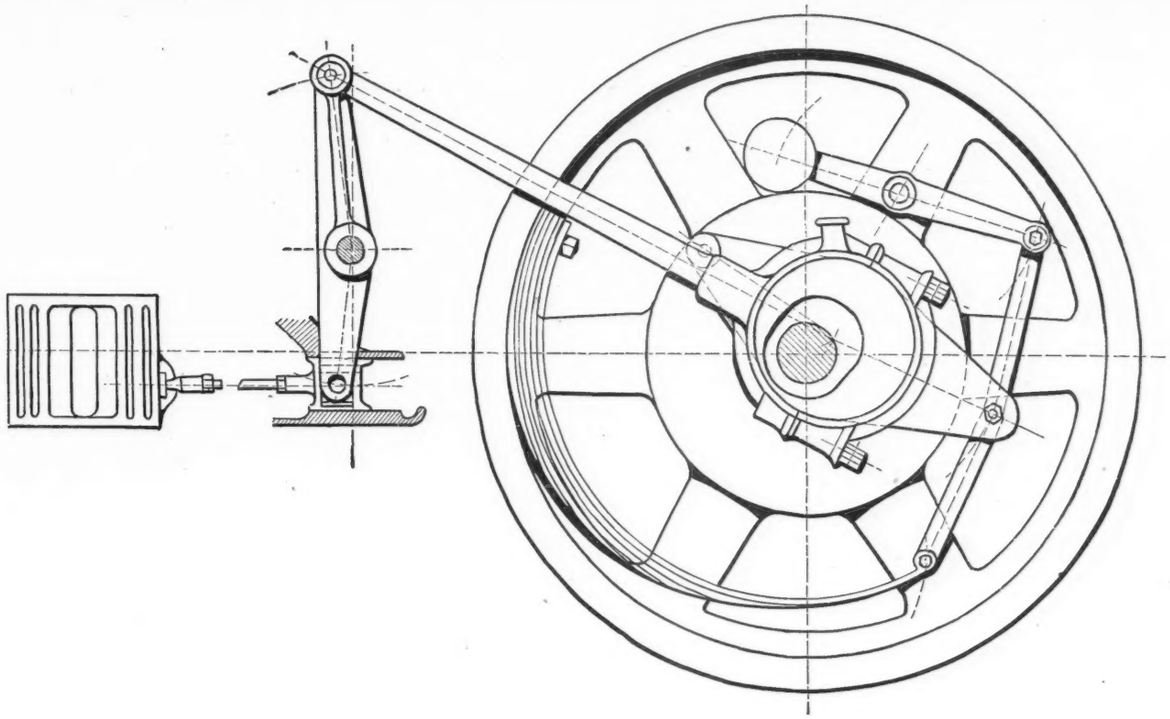


Fig. 4.—Governor.

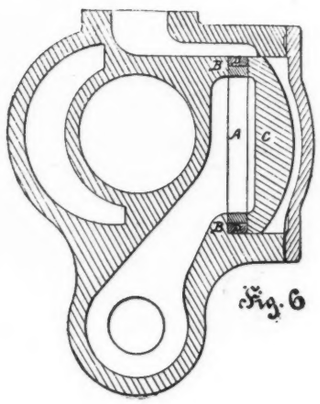


Fig. 6

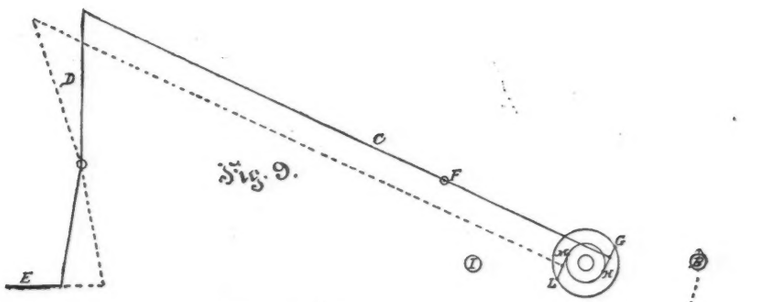


Fig. 9.

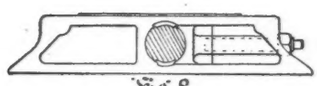


Fig. 8.

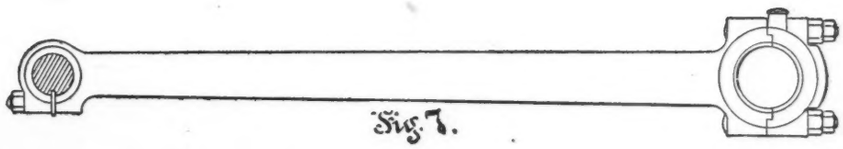


Fig. 7.

cide, there is a straight-way passage for the steam; and when the disk is turned half-way around, the valve is closed, and the recesses coming opposite, and being the same form as the openings, there is no face left exposed to rust. The engines are always to be run with an open throttle.

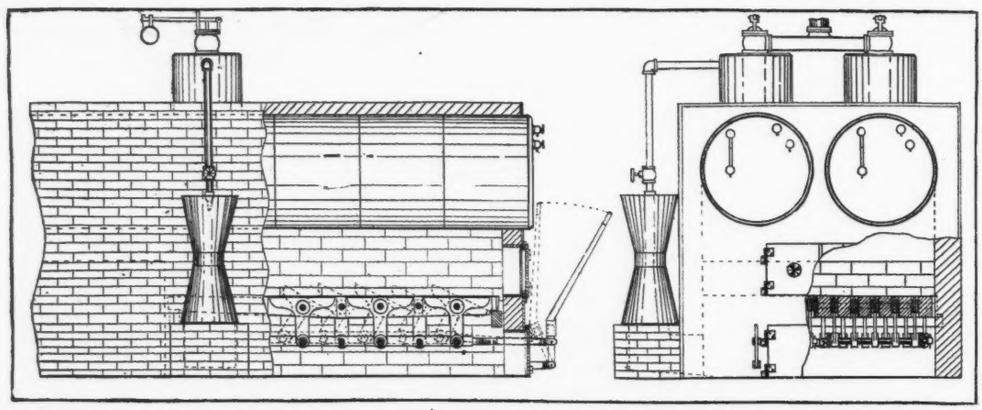
The material used in these engines is of the best quality obtainable, and the workmanship in all respects first class. They are run at medium or high speed, are so perfectly balanced as to run perfectly still on a solid foundation without holding-down bolts, and govern within the lowest fraction of variation, from full load to no load, and at all variations of steam pressure. All parts can be oiled from a common oil-can while in motion. The engine is built and sold in the West and Northwest by the M. C. Bullock Manufacturing Company, of Chicago; and for the Eastern, Middle, and Southern States by the Straight-Line Engine Company, of Syracuse.

ON THE MAGNETIZATION OF IRON AND STEEL.—Sir William Thomson, at a meeting of the British Association, read a communication from Mr. J. E. Ewing on the Susceptibility and Retentiveness of Iron and Steel. The author said that he had been experimenting in Japan on the effect of stress in relation to magnetization, and he had demonstrated the hitherto unsuspected fact that soft iron is capable of an immensely greater degree of magnetization than steel. The method employed was to subject wires to the magnetizing force, tapping them during its application, and withdrawing it gradually. When this plan was followed, 93 per cent of the charge remained. He had obtained magnetic intensity of 1590 units, while Thalen only obtained 40 from soft Swedish iron, and Roland 200. This result, Sir William Thomson said, was a satire on our knowledge of magnetism. The author also stated that he had computed the heating effect of the reversal of the induction in iron in absolute measure.

## THE HOWE CULM GRATE.

The Howe culm grate, which is illustrated this week, consists of the ordinary grate-bars, cast with holes through them, through which rods are passed carrying knife-edged rockers, which are connected together and are rocked by means of a lever in front of the furnace. The grate-bars, spaces, and rockers are made equal width, and the bars are preferably made full length of furnace, and divided up so that the rockers are arranged to break joints, which prevents the fire being left in ridges. The holes in the bars and rockers are cored, and for burning culm or anthracite coal-dust, the bars, spaces, and rockers are each three eighths of an inch wide; for burning larger sizes of coal, the parts are made proportionally. Among the advantages claimed for this new grate are these: That culm, small-sized anthracite, and bituminous coal can be successfully burned and thoroughly cleaned on this grate, and make as much steam as large-sized coal; that it can be cleaned in two minutes without the use of the poker, and without loss of steam, as the furnace-doors are opened when feeding the fire; that it breaks up clinker and cinder by means of the knife-edge rockers, and forces them through the grate; that it has nearly sixty per cent air space, which insures good combustion; and that, as the bars are of simple construction, they are not likely to get out of order.

The engineers of the different departments of the Lackawanna Iron and Coal Company, by whom the grate has been used, speak of it in high terms. A series of experiments conducted by Mr. C. M. Morse, mechanical engineer, of this city, representative of the patentees, on the premises of Mrs. C. L. Weston, No. 332 Seventh avenue, gave the following results: In the boiler-room are two boilers, which, until recently, had been running with a Jarvis furnace setting, burning egg coal, the grate surface per furnace being 40 square feet, and the expenditure for fuel for the month of June being with the Jarvis setting $19.60 per day. One furnace was then equipped with the Howe grate and a steam-blower, the supplementary air-ducts of the Jarvis setting being bricked up. One furnace, with hard firing, could furnish steam enough for a 150 horse-power engine, and the two were therefore alternately used to do that duty. On one day, the furnace equipped with the Howe grate and blower consumed 4315 pounds of Lackawanna culm at $2.35 per ton, and 1230 pounds of bituminous coal at $4.55 per ton, the total cost of fuel for the day being $7.02. On the next day, the other boiler, left unchanged, used 5234 pounds of egg coal at $4.95 per ton, a daily cost of $11.56, thus showing a saving in the cost in favor of the Howe grate of $4.54 per day. Both boilers together, on the following day connected, supplied steam for the engine and all other purposes, using 4072 pounds of egg at $4.95, 3672 pounds of culm at $2.35 per ton, and 133 pounds of bituminous coal at $4.55, making the total cost per day $13.12, against the average of $19.60 in June.



GASES OCCLUDED BY COKE.—A recent number of the *American Chemical Journal* gives some interesting details of an exhaustive series of experiments on the gases occluded by coke, carried out by Messrs. F. H. Storer and D. H. Lewis. Reichardt's method of exhausting with mercury and heating was used, but only to compare the results given by it with those afforded by the Sprengel pump; the flask containing the coke being exhausted and subsequently heated in a paraffine bath. The first experiments were made upon some air-dried coke from the cellar of a dwelling-house. The maximum temperature to which it was subjected was, as in all other cases, 200 degrees Fahr. By Reichardt's method, each gram of coke gave rather more than 1 c. c. of gas containing about 43 per cent of carbonic acid and 2·6 per cent of oxygen. With the Sprengel pump, each gram yielded about 0·7 c. c. of gas containing from 50 to 60 per cent of carbonic acid and from 2 to 6 per cent of oxygen, as well as carbonic oxide and nitrogen. In some cases where the pump was used, a current of nitrogen was driven through the flask for some time, to clear out the air more effectually. Some air-dried coke, which had been standing for two years in a dry storehouse, gave (by Reichardt's method) about the same quantity of gas as the above; the percentage of carbon dioxide being lower, and that of nitrogen and oxygen much higher. The same coke, however, with the pump gave less gas; but the percentage of carbonic acid was higher, and that of oxygen lower than in the first samples. Other experiments with old coke from out of doors, recently partially dried coke, and coke taken straight from a gas-retort gave results very similar, save that, in the last case, the percentage of carbonic acid, which was at first only between 7 and 11 per cent, increased (on keeping for two months) to 21 per cent. It would thus almost seem as if a slow oxidation of the carbon had gone on. It is noteworthy that the gases given off up to 100 degrees Fahr. invariably contained a higher percentage of oxygen, and a lower one of carbonic acid, than those by heating to 200° Fahr.

## A PLEA FOR PURE SCIENCE.*†

American science is a thing of the future, and not of the present or past; and the proper course of one in my position is to consider what must be done to create a science of physics in this country, rather than to call telegraphs, electric lights, and such conveniences, by the name of science. I do not wish to underrate the value of all these things; the progress of the world depends on them, and he is to be honored who cultivates them successfully. So also the cook who invents a new and palatable dish for the table benefits the world to a certain degree; yet we do not dignify him by the name of a chemist. And yet it is not an uncommon thing, especially in American newspapers, to have the *applications* of science confounded with pure science; and some obscure American who steals the ideas of some great mind of the past, and enriches himself by the application of the same to domestic uses, is often lauded above the great originator of the idea, who might have worked out hundreds of such applications, had his mind possessed the necessary element of vulgarity. I have often been asked, which was the most important to the world, pure or applied science? To have the applications of a science, the science itself must exist. Should we stop its progress, and attend only to its applications, we should soon degenerate into a people like the Chinese, who have made no progress for generations, because they have been satisfied with the applications of science, and have never sought for reasons in what they have done. The reasons constitute pure science. They have known the application of gunpowder for centuries; and yet the reasons for its peculiar action, if sought in the proper manner, would have developed the science of chemistry, and even of physics, with all their numerous applications. By contenting themselves with the fact that gunpowder will explode, and seeking no farther, they have fallen behind in the progress of the world; and we now regard this oldest and most numerous of nations as only barbarian. And yet our country is in this same state. But we have done better; for we have taken the science of the old world, and applied it to all our uses, accepting it like the rain of heaven, without asking whence it came, or even acknowledging the debt of gratitude we owe to the great and unselfish workers who have given it to us. And, like the rain of heaven, this pure science has fallen upon our country, and made it great and rich and strong.

To a civilized nation of the present day, the applications of science are a necessity; and our country has hitherto succeeded in this line, only for the reason that there are certain countries in the world where pure science has been and is cultivated, and where the study of nature is considered a noble pursuit. But such countries are rare, and those who wish to pursue pure science in our own country must be prepared to face public opinion in a manner which requires much moral courage. They must be prepared to be looked down upon by every successful inventor whose shallow mind imagines that the only pursuit of mankind is wealth, and that he who obtains most has best succeeded in the world. Every body can comprehend a million of money; but how few can comprehend any advance in scientific theory, especially in its more abstruse portions! And this, I believe, is one of the causes of the small number of persons who have ever devoted themselves to work of the higher order in any human pursuit. Man is a gregarious animal, and depends very much for his happiness on the sympathy of those around him; and it is rare to find one with courage to pursue his own ideas in spite of his surroundings. In times past, men were more isolated than at present, and each came in contact with a fewer number of people. Hence that time constitutes the period when the great sculptures, paintings, and poems were produced. Each man's mind was comparatively free to follow its own ideals, and the results were the great and unique works of the ancient masters. To-day, the railroad and the telegraph, the books and newspapers, have united each individual man with the rest of the world; instead of his mind being an individual, a thing apart by itself and unique, it has become so influenced by the outer world, and so dependent upon it, that it has lost its originality to a great extent. The man who in times past would naturally have been in the lowest depths of poverty, mentally and physically, to-day measures tape behind a counter, and with lordly air advises the naturally born genius how he may best bring his outward appearance down to a level with his own. A new idea he never had, but he can at least cover his mental nakedness with ideas imbibed from others. So the genius of the past soon perceives that his higher ideas are too high to be appreciated by the world; his mind is clipped down to the standard form; every natural offshoot upward is repressed, until the man is no higher than his fellows. Hence the

* Abstracts from an address of H. A. Rowland, of Baltimore, Md., Vice-President of Section B, American Association for the Advancement of Science.

† In using the word "science," I refer to physical science, as I know nothing of natural science. Probably my remarks will, however, apply to both, but I do not know.

world, through the abundance of its intercourse, is reduced to a level. What was formerly a grand and magnificent landscape, with mountains ascending above the clouds, and depths whose gloom we can not now appreciate. has become serene and peaceful. The depths have been filled, and the heights leveled, and the wavy harvests and smoky factories cover the landscape.

As far as the average man is concerned, the change is for the better. The average life of man is far pleasanter. and his mental condition better, than before. But we miss the vigor imparted by the mountains. We are tired of mediocrity, the curse of our country. We are tired of seeing our artists reduced to hirelings, and imploring Congress to protect them against foreign competition. We are tired of seeing our countrymen take their science from abroad, and boast that they here convert it into wealth. We are tired of seeing our professors degrading their chairs by the pursuit of applied science instead of pure science; or sitting inactive while the whole world is open to investigation; lingering by the wayside while the problem of the universe remains unsolved. We wish for something higher and nobler in this country of mediocrity, for a mountain to relieve the landscape of its monotony. We are surrounded with mysteries, and have been created with minds to enjoy and reason to aid in the unfolding of such mysteries. Nature calls to us to study her, and our better feelings urge us in the same direction. . . .

There is room for all in the work, and the race has but commenced. The problems are not to be solved in a moment, but need the best work of the best minds, for an indefinite time.

Shall our country be contented to stand by, while other countries lead in the race? Shall we always grovel in the dust, and pick up the crumbs which fall from the rich man's table, considering ourselves richer than he because we have more crumbs, while we forget that he has the cake, which is the source of all crumbs? Shall we be swine, to whom the corn and husks are of more value than the pearls? If I read aright the signs of the times, I think we shall not always be contented with our inferior position. From looking down, we have almost become blind, but may recover. In a new country, the necessities of life must be attended to first. The curse of Adam is upon us all, and we must earn our bread.

The scientific study of nature in all its branches, of mathematics, of mankind in its past and present, the pursuit of art, and the cultivation of all that is great and noble in the world—these are the highest occupations of mankind. Commerce, the applications of science, the accumulation of wealth, are necessities which are a curse to those with high ideals, but a blessing to that portion of the world which has neither the ability nor the taste for higher pursuits.

As the applications of science multiply, living becomes easier, the wealth necessary for the purchase of apparatus can better be obtained, and the pursuit of other things besides the necessities of life becomes possible.

But the moral qualities must also be cultivated in proportion to the wealth of the country, before much can be done in pure science. The successful sculptor or painter naturally attains to wealth through the legitimate work of his profession. The novelist, the poet, the musician, all have wealth before them as the end of a successful career. But the scientist and the mathematician have no such incentive to work; they must earn their living by other pursuits, usually teaching, and only devote their surplus time to the true pursuit of their science. And frequently, by the small salary which they receive, by the lack of instrumental and literary facilities, by the mental atmosphere in which they exist, and, most of all, by their low ideals of life, they are led to devote their surplus time to applied science or to other means of increasing their fortune. How shall we, then, honor the few, the very few, who, in spite of all difficulties, have kept their eyes fixed on the goal, and have steadily worked for pure science, giving to the world a most precious donation, which has borne fruit in our greater knowledge of the universe and in the applications to our physical life which have enriched thousands and benefited each one of us? There are also those who have every facility for the pursuit of science, who have an ample salary and every appliance for work, yet who devote themselves to commercial work, to testifying in courts of law, and to any other work to increase their present large income. Such men would be respectable if they gave up the name of professor, and took that of consulting chemists or physicists. And such men are needed in the community. But for a man to occupy the professor's chair in a prominent college, and, by his energy and ability in the commercial applications of his science, stand before the local community in a prominent manner, and become the newspaper exponent of his science, is a disgrace both to him and his college. It is the death-blow to science in that region. Call him by his proper name, and he becomes at once a useful member of the community. Put in his place a man who shall by precept and example cultivate his science, and how different is the result! Young men, looking forward into the world for something to do see before them this high and noble life, and they see that there is something more honorable than the accumulation of wealth. They are thus led to devote their lives to similar pursuits, and they honor the professor who has drawn them to something higher than they might otherwise have aspired to reach.

I do not wish to be misunderstood in this matter. It is no disgrace to make money by an invention, or otherwise, or to do commercial scientific work under some circumstances. But let pure science be the aim of those in the chairs of professors, and so prominently the aim that there can be no mistake. If our aim in life is wealth, let us honestly engage in commercial pursuits, and compete with others for its possession. But if we choose a life which we consider higher, let us live up to it, taking wealth or poverty as it may chance to come to us, but letting neither turn us aside from our pursuit.

The work of teaching may absorb the energies of many; and indeed, this is the excuse given by most for not doing any scientific work. But there is an old saying, that where there is a will there is a way. Few professors do as much teaching or lecturing as the German professors, who are also noted for their elaborate papers in the scientific journals. I myself have been burdened down with work, and know what it is; and yet I here assert that all *can* find time for scientific research if they desire it. But here, again, that curse of our country, mediocrity, is upon us. Our colleges and universities seldom call for first-class men of reputation, and I have even heard the trustee of a well-known college assert that no professor should engage in research because of the time wasted! I was glad to see, soon after, by the call of a prominent scientist to that college, that the majority of the trustees did not agree with him.

That teaching is important, goes without saying. A successful teacher is to be respected; but if he does not lead his scholars to that which is highest, is he not blameworthy? We are, then, to look to the colleges and universities of the land for most of the work in pure science which is done. Let us, therefore, examine these latter, and see what the prospect is. . . .

I have before me the report of the Commissioner of Education for 1880. According to that report, there were 389,* or say, in round numbers, 400 institutions, calling themselves colleges or universities, in our country! We may well exclaim that ours is a great country, having more than the whole world besides. The fact is sufficient. The whole earth would hardly support such a number of first-class institutions. The curse of mediocrity must be upon them, to swarm in such numbers. They must be a cloud of mosquitoes, instead of eagles as they profess. And this becomes evident on further analysis. About one third aspire to the name of university; and I note one called by that name which has two professors and 18 students, and another having three teachers and 12 students! And these instances are not unique, for the number of small institutions and schools which call themselves universities is very great. It is difficult to decide from the statistics alone the exact standing of these institutions. The extremes are easy to manage. Who can doubt that an institution with over 800 students, and a faculty of 70, is of a higher grade than those above cited having 10 or 20 students and two or three in the faculty? Yet this is not always true; for I note one institution with over 500 students which is known to me personally as of the grade of a high-school.

If the statistics were forthcoming—and possibly they may exist—we might also get an idea of the standing of these institutions and their approach to the true university idea, by the average age of the scholars. Possibly also the ratio of number of scholars to teachers might be of some help. All these methods give an approximation to the present standing of the institutions. But there is another method of attacking the problem, which is very exact, but it only gives us the *possibilities* of which the institution is capable. I refer to the wealth of the institution. In estimating the wealth, I have not included the value of grounds and buildings; for this is of little importance either to the present or future standing of the institution. As good work can be done in a hovel as in a palace. I have taken the productive funds of the institution as the basis of estimate. I find:

| | | |
|---|---|---|
| 234 | have below | $500,000. |
| 8 | " between | $500,000 and $1,000,000. |
| 8 | " over | $1,000,000. |

There is no fact more firmly established, all over the world, than that the higher education can never be made to pay for itself. Usually, the cost to a college of educating a young man very much exceeds what he pays for it, and is often three or four times as much. The higher the education, the greater this proportion will be; and a university of the highest class should anticipate only a small accession to its income from the fees of students. Hence the test I have applied must give a true representation of the possibilities in every case. According to the figures, only sixteen colleges and universities have $500,000 or over of invested funds, and only one half of these have $1,000,000 and over. Now, even the latter sum is a very small endowment for a college; and to call any institution a university which has less than $1,000,000 is to render it absurd in the face of the world. And yet more than one hundred of our institutions, many of them very respectable colleges, have abused the word "university" in this manner. It is to be hoped that the endowment of the more respectable of these institutions may be increased, as many of them deserve it; and their unfortunate appellation has probably been repented of long since.

It may be urged, that all these institutions are doing good work in education; and that many young men are thus taught who could not afford to go to a true college or university. But I do not object to the education—though I have no doubt an investigation would disclose equal absurdities here—for it is aside from my object. But I do object to lowering the ideals of the youth of the country. Let them know that they are attending a school, and not a university; and let them know that above them comes the college, and above that the university. Let them be taught that they are only half-educated, and that there are persons in the world by whose side they are but atoms. In other words, let them be taught the truth.

It may be that some small institutions are of high grade, especially those which are new; but who can doubt that more than two thirds of our institutions calling themselves colleges and universities are unworthy of the name? Each one of these institutions has so-called professors, but it is evident that they can be only of the grade of teachers. Why should they not be so called? The position of teacher is an honored one, but it is not made more honorable by the assumption of a false title. Furthermore, the multiplication of the title, and the ease with which it can be obtained, render it scarcely worth striving for. When the man of energy, ability, and perhaps genius, is rewarded by the same title and emoluments as the commonplace man with the modicum of knowledge, who takes to teaching not because of any aptitude for his work, but possibly because he has not the energy to compete with his fellow-men in business, then I say one of the inducements for first-class men to become professors is gone.

When work and ability are required for the position, and when the professor is expected to keep up with the progress of his subject, and to do all in his power to advance it, and when he is selected for these reasons, then the position will be worth working for, and the successful competitor will be honored accordingly. The chivalric spirit which prompted Faraday to devote his life to the study of nature may actuate a few noble men to give their life to scientific work; but if we wish to cultivate this highest class of men in science, we must open a career to them worthy of their efforts.

Jenny Lind, with her beautiful voice, would have cultivated it to

* 364 reported on, and 25 not reported.

some extent in her native village; yet who would expect her to travel over the world, and give concerts for nothing? and how would she have been able to do so if she had wished? And so the scientific man, whatever his natural talents, must have instruments and a library, and a suitable and respectable salary to live upon, before he is able to exert himself to his full capacity. This is true of advance in all the higher departments of human learning, and yet something more is necessary. It is not those in this country who receive the largest salary, and have positions in the richest colleges, who have advanced their subject the most; men receiving the highest salaries, and occupying the professor's chair, are to-day doing absolutely nothing in pure science, but are striving by the commercial applications of their science to increase their already large salary. Such pursuits, as I have said before, are honorable in their proper place; but the duty of a professor is to advance his science, and to set an example of pure and true devotion to it which shall demonstrate to his students and the world that there is something high and noble worth living for. Money-changers are often respectable men, and yet they were once severely rebuked for carrying on their trade in the court of the temple.

Wealth does not constitute a university, buildings do not; it is the men who constitute its faculty, and the students who learn from them. It is the last and highest step which the mere student takes. He goes forth into the world, and the hight to which he rises has been influenced by the ideals which he has consciously or unconsciously imbibed in his university. If the professors under whom he has studied have been high in their profession, and have themselves had high ideals; if they have considered the advance of their particular subject their highest work in life, and are themselves honored for their intellect throughout the world, the student is drawn toward that which is highest, and ever after in life has high ideals. But if the student is taught by what are sometimes called good teachers, and teachers only, who know little more than the student, and who are often surpassed and even despised by him, no one can doubt the lowered tone of his mind. He finds that by his feeble efforts he can surpass one to whom a university has given its highest honor; and he begins to think that he himself is a born genius, and the incentive to work is gone. He is great by the side of the molehill, and does not know any mountain to compare himself with.

A university should not only have great men in its faculty, but have numerous minor professors and assistants of all kinds, and should encourage the highest work, if for no other reason than to encourage the student to his highest efforts.

But, assuming that the professor has high ideals, wealth such as only a large and high university can command is necessary to allow him the fullest development.

(TO BE CONTINUED.)

## FURNACE, MILL AND FACTORY.

The New York, Pennsylvania & Ohio Railroad Company, after having tested the Brown hoisting and conveying machine by using, during two seasons, a plant consisting of three machines suspended on cable tramways, ordered an additional plant for its ore-dock in Cleveland. This plant, consisting of three machines with truss-bridge tramways, hoist-house, and hoisting appliances, is now receiving the finishing touches, and will perhaps be in operation by the time this reaches the readers of the ENGINEERING AND MINING JOURNAL. The bridges are each 180-foot span, the ends being supported on piers which rest on a track to which they are firmly held by a simple device, and on which the tramways are movable along the line of the dock. A ball-and-socket joint enables the workmen to adjust the front pier to the hatch of a vessel without moving the rear pier. In and between the back piers of two of the three bridges are the hoist-house and machinery, consisting of a locomotive boiler 16 feet long, 48 inches shell, and three double-acting four-inch cylinder hoisting-drums (Webster, Camp & Lane Machine Company's make), one of which is arranged at a right angle with the other two and with the line of movement of the piers, so as to allow the one bridge to be moved independently of the other two, which are connected and contain the hoist plants. All of it moves together, and can be driven along the track by one man at each pier turning the crank of the gearing arranged for that purpose. The bridges and piers present a very neat appearance. The trusses are of the inverted parabolic bow-string type, and the size and position of each part are designed and calculated with mathematical precision with reference to the duty each has to perform, a large allowance being made for safety. As the machine and bucket works within the space occupied by the truss, and the hight of clearance is the maximum hight of ore that the dock can safely sustain, the full width of the dock can be filled by the machine operated by one man in the hoist-house. The size of bucket used is one gross ton capacity, and the speed in handling is only limited by the rapidity with which the men on the vessel can fill the buckets. Great care has been taken to provide against any special strain or wear, and all emergencies of operating, even to providing to a great extent against the carelessness and cupidity usual to thoughtless or unprincipled workmen. The Brown Hoisting and Conveying Machine Company is about to bring to public notice a new and automatic system for charging blast-furnaces, ovens, kilns, etc., the first cost of which is cheaper. It does away with all top fillers, present style of hoist-house, etc., making it possible for one man easily to accomplish the whole work by operating an engine and accompanying mechanical arrangements. The system is the invention of Mr. Fayette Brown, and the details of construction and operation are by Alexander E. Brown. It has been tested by continuous service for a year or more at one of the most successful furnaces of the country, and already several large concerns have placed their orders for similar outfits.

Best & Gibson, furnace builders, St. Louis, have recently erected three annealing furnaces and two ovens for the Ashley Wire Company, Joliet, Ill., and have another contract for the same company for the building of seven more annealing furnaces and a muffle-furnace.

The articles of association of the Kalamein Alloy Company, Limited, were filed for record in Pittsburg on the 25th ult. The total amount of capital stock is $500,000, of which $460,000 have been paid in, that sum being paid to the owners for certain patent rights under which the company proposes to operate. The business of the company is to be the manufacture, use, and sale of the inventions mentioned, and the stockholders are the following gentlemen, each of whom owns the amount stated: Henry W. Shepard, $230,000; H. W. Oliver, Jr., $40,000; D. B. Oliver, $40,000; J. B. Oliver, $40,000; George T. Oliver, $40,000; Henry Roberts, $40,000; and Cadwallader Evans, $30,000. The kalamein alloy is a substance invented by Mr. Henry Roberts, who has devised a process to be substituted for galvanizing.

The Steelton *Reporter*, 27th ult., says: No. 2 furnace was not damaged to so great an extent as we thought it was from the explosion on Friday of last week. The repairs were completed and the blast and a cast made in five hours afterward. The furnace has been doing good work all the week. No. 5 furnace produced 27 tons of pig-iron one day this week, being the largest product ever obtained from "Little Dock." Masons are at work on the stone foundations for the new hot ovens at No. 1 furnace. The basic mill has been running successfully and increasing in production. The large rolls at the new merchant mill will be put into operation on Wednesday or Thursday. All the machinery has been tested and found to be in good working order, and the successful starting of the new mill is anxiously looked for. Mr. E. C. Felton was in Tyrone this week, witnessing the rolling of steel skelp from the basic mill. The steel is used for making boiler tubes, and is found especially fine for that purpose, being easily rolled and welding nicely.

The Link-Belt Machinery Company, of Chicago, has recently filled orders as follows: The Lead Mine Company, of Bingham, Utah, an ore-conveyer; the Columbus & Hocking Coal and Iron Company, Columbus, O., a 40-foot coal-elevator; the Boston Gas-Light Company, of Boston, a 75-foot double-strand coal-elevator; the Abbey Coal Mining Company, St. Louis, Mo., a coal-elevator; Wells, Fargo & Co., at Salt Lake City, an ore-elevator, to be used in a mine.

John H. Davey, of Galena, Dakota, is putting in a Gates pulverizer from the works of Charles Kaestner & Co., Chicago, and S. L. Bailey and Robert Seaman have ordered one to go to their Wyoming mines. The manufacturers state that they are ready to guarantee 40 tons a day through a 40-mesh screen, with 15 horse-power. The machine takes up a floor-space of 11 by 6 feet, and weighs 18,000 pounds.

The famous Société John Cockerill, of Belgium, has, according to an annual report just published, established an agency in this city.

The property of the Norwood Lumber Company was sold at auction in Norwood, N. Y., November 7th, to A. O. Brainerd, of St. Alban's, Vt., for $166,500.

The Ohio Iron and Steel Company, operating the Mary furnace at Lowellville, has just completed the erection of a large iron casting-house. This, with the improvements made the past season, makes it one of the finest iron plants in the Mahoning Valley.

The sheriff's sale of the Huntington Car-Works property was held recently, and lasted several days. Forty-five creditors were present, whose aggregate claims amounted to $350,000. Considerable litigation is expected before a final adjustment of the claims is made.

Under an order of the Supreme Court in Equity, at St. John, N. B., on November 5th, there was offered at auction the Coldbrook iron-works and rolling-mill and the Coldbrook nail and spike factory. The properties, which were sold together, were knocked down for $32,000 to the Maritime Bank of the Dominion of Canada.

H. G. Lapham & Co. have placed their order with the Lechner Manufacturing Company, Columbus, O., for chain elevators and conveyers, to be used in their tannery at Tunkhannock, Pa., for conveying dry and spent tan. The Lechner Company has also received orders for chain belting from Samuel Williamson, of Cincinnati, Phœnix Iron-Works, Meadville, Pa., and others, to be used for driving purposes.

## MINERAL PATENTS GRANTED BY THE UNITED STATES LAND-OFFICE.

### ALABAMA.

HUNTSVILLE DISTRICT.

Franklin Pottery Company, Montague lode.

### ARIZONA.

TUCSON DISTRICT.

Silver King Gold and Silver Mining Company, Burro Burro lode. Philip Corbin, Mammoth lode. John B. Richards *et al.*, Independence lode.

### CALIFORNIA.

LOS ANGELES DISTRICT.

Robert Gardner, Gardner lode.

SAN FRANCISCO DISTRICT.

W. E. Gillespie, Occidental Quicksilver mine. Edward R. Jones, Red Hill placer.

### COLORADO.

CENTRAL CITY DISTRICT.

Peter G. Gustafson, Little Emma lode. Henry C. Parker *et al.*, Florida lode. William A. Brown, Nevada lode. E. W. Dickinson *et al.*, Garfield lode. John L. Hopper, Belle of Empire lode. Aurora Mining Company, Frankfort lode.

DEL NORTE DISTRICT.

Golconda Gold Mining Company, Gamecock lode.

DURANGO DISTRICT.

E. J. Warner, Junction placer. San Juan & New York Mining and Smelting Company, Ruby No. 1 and Ruby No. 2 placers. John F. Williams *et al.*, Victoria lode and mill-site. Rico Silver Mining Company of Colorado, Georgia lode.

LAKE CITY DISTRICT.

Green Mountain Milling and Mining Company, Blue Bird lode. Nathaniel Slaight, New Dollar and Fairview lodes. Michigan & Colorado Mining Company, Silver Arrow and Silver Nugget lodes. George A. Bute *et al.*, Alama lode. John Fallen, Ansborough lode.

LEADVILLE DISTRICT.

George G. Washburn *et al.*, Snow Drift lode. Joel W. Smith *et al.*, Borealis lode. Mount Ætna Gold and Silver Mining Company, Ocean Wave lode. J. O. Hudnute *et al.*, Mammoth Extension lode. William P. Farris *et al.*, Eureka lode. Silver Bell Mining Company, Silver Bell lode. H. C. Francis *et al.*, Elk lode. Thomas Starr *et al.*, Thistle lode. Star Mining Company, placer embracing lodes.

PUEBLO DISTRICT.

George Weetman, Hennan lode.

### IDAHO.

BOISE CITY DISTRICT.

Philadelphia Mining and Smelting Company, West Fork No. 1, West Fork No. 2, Black Hawk, Yellow Jacket, and Satellite lodes. George Francy, Vienna Extension lode. Henry E. Miller, Minnie Moore lode. Samuel Marsh *et al.*, Scotia lode.

### MONTANA.

HELENA DISTRICT.

Fielding L. Graves *et al.*, Erie lode. Saly Runnheim, Jesse lode.

### NEVADA.

CARSON CITY DISTRICT.

Golden Fleece Gold and Silver Mining Company, Fleece lode.

### NEW MEXICO.

LAS CRUCES DISTRICT.

John S. Hutchinson, Pueblo Spring lode.

### UTAH.

SALT LAKE CITY DISTRICT.

Jacob S. Boreman *et al.*, Exchequer lode. Samuel Kahn *et al.*, Oneida No. 2 lode. Jacob S. Boreman *et al.*, Chester lode.

## GENERAL MINING NEWS.

### ARIZONA.

COCHISE COUNTY—TOMBSTONE DISTRICT.

BOSTON & ARIZONA SMELTING AND REFINING COMPANY.—The starting up of these reduction-works and the resumption of work at the Stonewall mine are announced.

CONTENTION.—It is reported that a new body of ore has been struck while prospecting in a northeasterly direction.

EMPIRE.—The new shaft is down 45 feet. This shaft is to tap the ore-body which extends from the Good Enough and Way Up mines. The rock has changed from lime into porphyry heavily stained with iron. In the old workings, the timbering has been completed, and brisk prospecting from the 200 and 400-foot levels is going on. A cross-cut east from the 400 foot level is running, and is at present in a very hard limestone.

GILDED AGE.—This mine has been sold to the owners of the Way Up mine. Underground surveys are making with the intention of starting work on the mine.

MAMIE.—Considerable work in the upper levels of this mine is doing. The lessees have just completed a shipment to the Watervale mill of nine tons of ore that samples $67 to the ton.

PROMPTER.—An assessment of ten cents per share has been levied, the money to be used for the erection of hoisting-works.

SAN PEDRO.—This mine has been leased.

PIMA COUNTY.

It is stated that a smelter will be erected at Tucson very shortly. Mr. Aaron Mason, who is interested in the enterprise, is in Tucson, attending to the preliminary arrangements. A thirty-ton smelter will first be put up. Power will also be put in at same time for a copper smelter. Copper will be bought from the start. With the smelter, there will also be sampling-works and concentrating-tables.

PINAL COUNTY.

RAY COPPER.—The superintendent reports, October 29th: Developments continue very favorable. North drift, 50-foot level, now in 45 feet, still in heavy native copper—sheet-copper, but increasing in thickness of the sheet. Cross-cut, 100-foot level, in 26 feet, also in native copper and carrying considerable glance with the native. Winze No. 3 from station 100-foot level, now down 31 feet; carrying considerable glance for the past three days, and some oxide. The native lies to the northwest. At 50 feet, we shall put in another station, then cross-cut and drift for the native. Our ore in this winze (copper glance) has assayed as high as 62 per cent. No. 1 shaft will be put in position at once. I have put a steam-pump on the well, to enable the men to continue sinking the same to the bed-rock.

SILVER BOW COUNTY.

The Anaconda Company has made arrangements with the Union Pacific for the extension of a branch line connecting Stuart Station, on the Utah & Northern, with the town of Anaconda. It is understood that the work of construction will begin at once, and that by the first of December the branch will be completed and in operation. In addition to this branch, the Union Pacific Company has agreed at once to begin the construction of a second branch from the present terminus of the road at the Montana smelter, to the St. Lawrence and Anaconda mines. The road-bed and ties will be broad-gauge, and the track for the present will be narrow-gauge. The conditions of the contract are, that the Anaconda Company is to procure the right of way, and that the Union Pacific Company will consent at any time to the laying of a third rail on the branch by the Northern Pacific Company.

SUMMIT VALLEY DISTRICT.

COLUSA.—According to the *Inter-Mountain*, a private letter received from London states that the negotiations for the sale of this mine and plant to English capitalists have been almost concluded. The price, if the sale goes, is understood to be $1,500,000.

JOSEPHINE.—It is claimed that this is an extension of the Lexington. The ore-body varies in width from three to ten feet, and pulps in the mill about $45. Since operations on the mine were resumed a short time ago, 300 tons of ore have been hoisted, and worked in the Silver Bow mill.

LEXINGTON.—The company is opening up the Allie Brown, a vein which runs parallel with the main property. The shaft is now down 50 feet, all in ore, which mills 50 ounces.

POLLOCK.—This prospect is located east of the Poser. The claim contains two separate and distinct veins. Shafts have been sunk and a tunnel is running on one of the veins. A 100-ton lot has just been sent to the Moulton mill to be treated.

POSER.—The daily product averages 20 tons, which pulps in the Silver Bow mill about $35. The productive capacity of this mine is considered sufficient to supply a 40-stamp mill, and it is among the probabilities that the company next year will have reduction-works of its own.

WASHOE.—An important strike has been made at a depth of 212 feet.

### CALIFORNIA.

MONO COUNTY—BODIE DISTRICT.

BODIE CONSOLIDATED.—During the week ended October 27th, 216 car-loads of ore were hoisted from the mine, 13 car-loads of which were from the 770 (shaft) level and 137 car-loads were from the stopes between the 640 and 780-foot levels. The remaining 66 car-loads were extracted from the old workings at the 206 and 306-foot levels. During the week, 163·535 tons of ore were hauled to the mill and 136·765 tons of ore were crushed. The average assay value of the pulp was $37.83 per ton; that of the tailings was $6.20 per ton.

STANDARD CONSOLIDATED.—There were extracted and shipped to the mills 1436 tons of ore during the week ended October 27th; received 1585 ounces of crude bullion. There is no change to notice in the appearance of the stopes.

PATERSON DISTRICT.

SUMMERS.—A new strike has been made in the lower tunnel. The ledge is six feet wide. The little five-stamp mill is running steadily, and cleaning up from $20,000 to $25,000 per month.

SWEETWATER.—The Great Western, Lookout, and other mines belonging to this group are looking well. Operations have been suspended pending negotiations for their purchase by a New York company. The mines are bonded to William Irwin, representing the Standard Company, of Bodie.

NEVADA COUNTY.

MAGENTA CONSOLIDATED.—The company has been reorganized. About nine years ago, a shaft was sunk to the depth of 365 feet, and about 1000 feet of drifts were run, but no stoping was done. The mine has been idle most of the time since; the company then owning the property not having sufficient capital to develop it. Work has now begun, and developments will be pushed vigorously.

YUBA COUNTY.

EXCELSIOR WATER AND MINING COMPANY.—This company has begun an action in the Superior Court to recover $266,692 from J. P. Pierce, of Santa Clara. The complaint alleges that defendant was a stockholder and director of said corporation, and that on nineteen different occasions between July, 1877, and September 22d, 1879, resolutions were adopted declaring dividends upon the shares of stock of said corporation, and that dividends were paid thereon at times when there were no surplus earnings or profit, and that, in fact, said dividends were drawn from the capital stock of said corporation; it also alleges that James P. Pierce was a director, and was present and voted for each of the resolutions declaring such dividends.

### CANADA.

PROVINCE OF QUEBEC.

DOMINION PHOSPHATE AND MINING COMPANY.—A special meeting of the stockholders will be held at the company's office in Montreal, November 14th, for the purpose of considering the matter of increasing the stock of the company, and to decide whether the company shall accept or decline to purchase the property known as Lot No. 18, 7th Range, Township of Portland East, County and District of Ottawa, Province of Quebec.

### COLORADO.

CHAFFEE COUNTY.

CLAREMONT.—The Red Mountain Mining Company began operations last year, but, falling into litigation, did not accomplish much. Its troubles have, however, been adjusted, the company dissolved, and the Claremont Mining and Milling Company is its successor. The company owns mining property in the Red Mountain District, including the Gibraltar and Bonanza lodes. A thirty-stamp mill will be erected soon.

TABOR VS. COLUMBUS.—The suit of the Tabor mining lode claimants against the Columbus Mining and Milling Company, on trial in the United States Court at Denver, has been decided in favor of the Tabor. The judgment awarded the plaintiffs the disputed ground and $4500 damages.

CLEAR CREEK COUNTY.

DIAMOND.—This tunnel is now 2188 feet in length. Much interest is taken in the developments lately made on the first intersection of the Corry City veins which this tunnel cuts at 2100 feet from its mouth. Thus far, four distinct and well-defined veins have been encountered, within a distance of 50 feet of cross-cutting. The other veins cut by this tunnel show small streaks of ore. The East Dives Company is working its property through this tunnel. Arrangements are making for extended workings in and through the tunnel and property. It has cost $1,000,000 to drive the tunnel, not taking into consideration other developments. The production up to the present time of the lodes cut by the tunnel is as follows: No. 5 and E. K. Baxter lode, $350,000; D. T. No. 6, $160,000; Pelican & Dives, over $2,000,000, besides considerable production from smaller veins.

DOLORES COUNTY.

NELLIE AND ELLA.—These mines have been sold for $50,000.

RICO REDUCTION COMPANY.—The company has purchased a half-interest in the Little Susie group of mines on the West Dolores, nine miles above the Fish Fork. The mines are the Little Susie, Little Wonder, Russian Bear, Democrat, and Governor Grant lodes, all near together.

GILPIN COUNTY.

COTTON.—This mine, situated on Bobtail Hill, has been sold for $25,000.

GUNNISON COUNTY.

DOMINGO.—This mine has been sold to Missouri capitalists for $20,000.

HINSDALE COUNTY.

CROOKE MINING AND SMELTING COMPANY.—No work will be done at the Ulé for an indefinite period except to keep down the water. The steam-power at the mine will be used to drive the concentrator. At the Ute, all the present forces will be continued and the mine driven to its full capacity. It it expected that enough ore will be taken from the Ute to keep both sides of the concentrator in operation.

HENSON CREEK REDUCTION COMPANY.—The concentrator has made several successful runs. The machinery worked well, but the water in the creek is growing visibly less, and it is feared that soon there will not be enough to run the mill. The smelter can be completed as soon as there is demand for it, and can be put in operation on sixty days' notice, all that is required being three thousand firebrick and the erection of the blast-furnace, the columns and piping being on the ground.

SAN JUAN & WISCONSIN.—Work on the Lone Tree and Seventy-six lodes has begun. The company is securing patents on all its properties.

LAKE COUNTY.

A. Y.—The ore production is confined principally to the extraction of sulphide ores that formerly would not pay mining expenses, and at present smelting rates return only small profits.

CATALPA.—During October, the mine produced only a limited quantity of ore; and as a consequence, the profits are small. The manager stated that, notwithstanding this fact, he would be able to transmit to the company $1000 out of the ore receipts after paying the month's working expenses.

DENVER CITY & LEE BASIN.—These mines, on Yankee Hill, after a suspension of about nine months, are to be started up again. The properties consist of three full claims, and were first acquired by the present company in 1879. The strikes in the Dexter and Elkins shafts, just west of the Denver City and Lee Basin claims, have led to the resumption.

DUNKIN.—During October, 278 tons of ore were extracted and sold to the smelters, returning $6290.98; expenses, $3133.66; net profit, $1457.32.

HARRISON.—These works, after a suspension of about two months, have resumed operations.

HENRIETT.—Developments are now in progress which promise to result in valuable discoveries of ore. At a stockholders' meeting held in London, England, resolutions to wind up the company voluntarily, and appointing Mr. William A. Rose liquidator, were carried unanimously.

IRON HILL CONSOLIDATED.—This company has its machinery on the Imes shaft in good working condition. The developments contiguous to the Imes are preparing for active work, and in a short time, this portion of the property will be producing regularly. The workings of the Imes are still 120 feet distant from the farthest north drift of the White Cap, the nearest working-shaft of the same company. The two shafts will be connected as soon as possible. The production of the mines for October was in excess of the yield during the previous month, and the properties are looking well.

ST. BERNARD MINING COMPANY VS. LESSEES OF MOYAMENSING CLAIM.—Suits were filed in the District Court, at Leadville, November 3d, for over $500,000 damages. The suits were instituted by the St. Bernard Mining Company and the lessees of the Moyamensing claim, each of which sues for the recovery of $300,000, making a total of $600,000, which Messrs. Dennis Sullivan, James Dexter, and others, are expected to refund. The claim is based on the extraction of ore from the Moyamensing claim, which ore, it is alleged, was extracted from the Moyamensing claim and hoisted through the South May Queen and Dexter shaft. The suit is one of the largest yet instituted in the local courts, and one involving many intricate questions of mining law.

LARIMER COUNTY.

At Fort Collins, a meeting of citizens was recently held to take the necessary steps to organize a stock company to bore for oil, coal, and gas. It was decided to file articles of incorporation, and to solicit the citizens to subscribe to the stock

OURAY COUNTY.

Owing to the announcement made on the 15th of October by the mine-owners, that miners' wages would be cut fifty cents per day on November 1st, the miners at Telluride have quit work, and every shipping mine in Marshall Basin is closed. Both the mine-owners and men are determined to stand firm.

SAN JUAN COUNTY.

BISMUTH.—The concentrator of this company was started up, and all the ore at the mill run through with success. The 3500-foot tramway will be completed soon, and will be ready for business during the winter. About 60 men are employed about the mines and mills, and at present matters are rapidly arranging at the Sampson mine to allow them an opportunity to make a production equal to the capacity of the mill, which will be run night and day with the capacity of 30 tons every twelve hours.

ECLIPSE.—The capacity of the mill is to be enlarged. Arrangements are to be made for working the Red Cross and Mountain Queen mines, owned by the company. The smelter will be put in operation to work these ores.

LITTLE ABBIE.—The president of the company has arrived in Silverton for the purpose of straightening up the affairs of the company and resuming work on the Abbie tunnel, and opening up the Belcher vein on Picayune Mountain. This property was worked last winter by a large force of men, who quit work on account of the company's failing to pay them monthly. The company owns a large group of mines, extending up over Picayune Mountain to Eureka Mountain.

SUMMIT COUNTY.

HORN-SILVER.—This group of claims at Red Cliff, numbering eight, has been sold for $35,000. The property was purchased by a syndicate. Work will begin at once.

KINGFISHER.—The new strike made in No. 2 drift consists of two and a half feet of fine ore.

## DAKOTA.

FATHER DE SMET.—The report of the superintendent for the week ended November 1st shows: Ore extracted from the first, second, and third levels, 2895 tons. Ore milled, 3000 tons. Golden Gate east cross-cut, third level, advanced 9 feet; total length, 105 feet. Golden Gate south header, second level, advanced 6 feet. Header in 77 feet.

HARNEY PEAK TIN MINING COMPANY.—This company has recently been organized at Rapid City. The property consists of twenty tin-bearing quartz locations near the summit of Harney's Peak, and a large scope of stream-tin ground lying along the branches of Palmer's Gulch, together with various water-rights, mill-sites, etc. Mr. G. F. Randall, an English engineer and representative of English capitalists, has reported favorably on the property, and before his departure made the following proposition to the company: He to organize an English company with a capital of $500,000; such company to furnish $250,000 for developing the mines and purchasing machinery within a certain specified time; the local company to turn over the property upon receipt of $250,000 or one half the capital stock (non-assessable). An agreement which binds the company to give a bond upon the property on payment of $10,000 has been executed, and as soon as part of the money has been paid, work will be commenced. Unless the Black Hills *Journal* has horribly garbled the "Professor's" report, it furnishes ample testimony for the conclusion that he does not know what he is writing about, not to speak of how he writes. For the edification of our readers, we quote:

The first tin ore is found about half a mile from the base of the mountain, at which point a ridge of greisen quartz rock some 300 feet in width and from 100 to 500 feet in hight, above the surface, is found. This ridge extends for over one mile, and capes the two branches of Palmer Creek, producing suitable sites for mills, and adequate water-power for concentrating-works. The rock is composed of mica, silica, and porphyry, carrying a large percentage of black tin crystals, which yield under assay from 50 to 75 per cent of pure metallic tin and from 8 to 10 per cent of nickel. Large veins are found in this ridge which will yield 75 per cent of black tin crystals, and vary in width from three to eight inches. No rock could be easier or better situated for mining purposes. I was able with an ordinary hammer to break it at any point; and in some hundreds of samples which I examined, was unable to discover any except what contained a high percentage of tin crystals. At a distance of a quarter of a mile, running parallel with this, the erect ridge is continued. This is of still larger dimensions, and extends from the head of the east branch of Palmer's Gulch to nearly the summit of the mountain, and in some cases 600 to 800 feet in hight ABOVE THE SURFACE. The tin crystals in this mass are almost incredible, in many cases where they occur being 50 per cent of the quartz-rock—the black crystals in contrast to the white spar and shining mica, presenting a most beautiful appearance, exceeding in size two and a half inches in diameter, yielding under analysis from 70 to 75 per cent pure tin, and from 8 to 15 per cent of nickel. From this to the top of the mountain, a distance of about 1000 feet perpendicularly, the same formation extends, containing ore in perfectly inexhaustible quantities. This rock needs no mining whatever. It is simply throwing down the greisen rock into chutes and ore-bins and carrying the same to the mill for crushing and concentrating. To form any estimate of the extent of this formation is impossible, the magnitude is so great, and it is no exaggeration to state that it requires a fortnight even to survey this mass of rock. These mines will certainly rule the tin markets of the world. The ore can without doubt be mined and concentrated for from five to ten per cent per ton, with suitable appliances, and the quantity is so enormous that for years to come none but the richest portions need be touched.

The mining community of the Black Hills should raise a subscription to pay the expenses of the "Professor's" trip back to England on condition that he will never come back. He is hurting the prospects of their country as a future tin-producing district. Turn him out!

## GEORGIA.

LOUD.—The sale of this placer mine will take place January 8th, at Cleveland, O.

## IDAHO.

The scarcity of cars at Hailey to move the Wood River ores and bullion is getting alarming and is seriously interfering with the yield of the mines.

ALLEN.—This group of mines has been purchased by the Buzzo Silver Mining Company for $50,000.

## MAINE.

A stock company has been formed to work the iron mine at Webb's Mills, Casco, discovered many years ago. The necessary buildings are in course of construction. The ore will be shipped to Portland.

DOUGLAS.—The annual meeting was held at Bangor recently. Frank H. Williams was chosen secretary, and the following board of directors was elected for the ensuing year: Eugene H. Clapp, Horace P. Tobey, and Frank H. Williams, of Boston; Frederick M. Laughton and John S. Jennes, of Bangor; Hanson Gregory, Jr., of Rockland; and William D. Swazey, of Rucksport. No business of public importance was transacted. The result of the subsequent directors' meeting, held in Boston, has not yet been learned.

## MICHIGAN.

The following mines mentioned below produced during October as follows:

| | Tons. | Lbs. |
|---|---|---|
| Franklin | 195 | 1355 |
| Huron (about) | 70 | ..... |
| Pewabic | 48 | 450 |

It will be seen that the Franklin comes to the fore with the largest product ever taken from the mine in one month. The Huron also makes a good return, considering that the stamping capacity of the mine is confined to one head.

English capitalists have lately visited Rockland for the purpose of examining and buying the National, Minnesota, Rockland, and Superior copper mines. The different properties adjoin and have a length of 3½ miles, and aggregate about 7000 acres. If they buy this, they propose to consolidate all the properties and make one or possibly two mines, and drive in an adit east from Ontonagon River at a depth of about 500 feet, and this will unwater all of the old mines and save future pumping.

ARGYLE.—This iron mine has been closed down, owing to the depressed condition of the market.

ERIE.—The sale of this iron mine, negotiations for which have been pending for some weeks, is announced. The purchasers of the property, of whom Judge Hoadley is said to be one, have not yet organized as a company. The purchasers intend to buy other properties on the same range.

INDIANA IRON COMPANY.—At a special meeting recently held, the capital stock was increased. The amount is not reported.

METROPOLITAN.—A new and hitherto unknown vein of blue ore, 16 feet wide, is reported as the latest development.

STERLING.—Work has been entirely suspended.

WHITE PINE.—This copper mine, on Section 5, two miles east of Nonesuch, and on the same vein, and down 135 feet, with good show of copper from the surface down to the bottom, has just stopped work for the winter, on account of the low price of copper, but will start up next spring with stamping machinery.

## NEVADA.

ELKO COUNTY.

NAVAJO.—The new pumps have been tested, and work satisfactorily. Hoisting ore has begun. It is though tthat there is sufficient water to start the mill soon after the first of November.

EUREKA COUNTY.

SILVER CONNOR.—The body of ore found on the 250-foot level is developing. The ore runs in value at the rate of $60 per ton.

SILVER STATE.—The mines comprising the company's property are the original Baltic, Hilma, Confidence, and Silver State, all of which are United States patented claims. The company has run a tunnel under the apex of the property, where it expects to strike the vein at a depth of from 200 to 300 feet. The main tunnel is 370 feet in length. At the distance of 320 feet from the mouth of the tunnel, a favorable iron formation was struck and followed by a cross-cut run in a northerly direction, which is now in eighty-one feet. Forty feet from this cross-cut, cross-cut No. 2 begins. It has a present length of a little over 100 feet. The face is in quartz and iron, with low-grade ore, which is followed in the working of the present contract.

STOREY COUNTY—COMSTOCK LODE.

The station for the new hydraulic pump for the combination shaft is completed, and they are now leveling down the rock for the timbers on which the machinery will be set up. November 3d, the time expired in which the machinery had to be completed by the contractors at San Francisco.

ALTA.—The water is below the top of the 2150 drift, and is steadily lowering. This is the last level remaining to be drained; but as the source of the water is on this level, progress for the last 20 feet has been necessarily slow. It will take some time to put cages in and perform other necessary repairs before resuming prospecting.

NORTH GOULD & CURRY.—The lawsuit which has been pending for so long a time against this company has been settled and the case dismissed.

WHITE PINE COUNTY.

MARTIN WHITE.—At the present time, work is carried on in the mine, taking out ore and prospecting for more. There is no ore reduced, but it is accumulating.

## NEW MEXICO.

BERNALILLO COUNTY.

The five placer mining companies recently formed in Albuquerque for working the placer grounds at Golden have been consolidated.

GRANT COUNTY.

There are eight claims in the vicinity of Kingston, in which ore has been struck. These claims are the Bullion, Superior, Lady Franklin, Iron King, Brush Heap, Andy Johnson, Illinois, and Monasca. The latter is on the South Percha, but three miles distant from the town. In addition to these, the claims which promise well in both low and high-grade ores are numerous.

OLD MAN.—Every thing looks promising. As stated, there are fully 2000 tons of ore out. This is mainly low-grade or milling ore, the body having been stripped of high-grade, which has been shipped and sold. In the mine, enough ore is in sight to keep the mill running all winter.

## PENNSYLVANIA.

The Silver mine in Garland, which caused considerable agitation two years ago, is again worked. A company of capitalists sank a shaft at that time, but abandoned it when thirty feet deep. The owner of the land and another man are now working it. The latter is to sink a shaft 100 feet for half of the profits. No person is allowed to enter the shaft, and the operators refuse to speak on the subject.

## UTAH.

BEAVER COUNTY.

CACTUS.—The company has just put a new Knowles pump into the mine. The new concentrating jiggers have arrived in Frisco, and will soon be erected and in operation. A series of tanks and reservoirs has been built, of sufficient capacity to hold all the water that passes through the machinery, so that it may be pumped back, and used over and over again.

BOX ELDER COUNTY.

LEAD.—The mine is producing about fifty tons of jigging ore daily, and is reported to be looking well in all its workings.

MARTIN TELEGRAPH.—This location, situated near the Yosemite, is working about one hundred men, and is sending to the surface large quantities of good ore.

JUAB COUNTY.

MAMMOTH.—Reports in Salt Lake papers state that this company has offered to compromise with its creditors, paying twenty-five cents on the dollar.

SUMMIT COUNTY.

BON HOMME.—An incline is sinking which is now about seventy-five feet deep, all the way in a vein from four to seven feet thick. The vein carries a large amount of black manganese.

UINTAH.—Preparations are making by this company to resume work on its claims at the base of Rebellion Hill.

## WYOMING.

CARBON COUNTY.

Considerable work has been done at Ferris during the past months on the Pride of the West, Columbia, Leonidas, and some others, all of which show mineral in paying quantities, the character of ore being argentiferous galena, carbonates, and chlorides. Many locations have recently been made.

COLUMBIA.—The mine has a vein four and a half feet in width, carrying galena, carbonates, and gray copper.

LEONIDAS.—This is a contact vein ten feet in width, the ore being galena, oxides, and carbonates.

PRIDE OF THE WEST.—Two shafts were sunk, one tunnel driven, and an open cut made during the summer. All the developments made show favorable prospects.

## FINANCIAL.

### Gold and Silver Stocks.

NEW YORK, Friday Evening, Nov. 9.

Business in the mining market continues very dull, and a holiday coming in this week has tended to further demoralize the market. The principal feature of the market was Horn-Silver, which suffered a further decline from last week's prices. Chrysolite was an exception to the general depression which seemed to prevail, and was quite strong to-day. A full summary will be found below. The total number of shares sold aggregates 97,665, as against 117,935 last week.

The Comstock shares were very quiet at about steady prices. California sold from 26@25c. under a small business. Consolidated Virginia was moderately dealt in at about steady prices, selling from 48@45c. Sierra Nevada was weak, with a very small business, selling from $3.80@$3.60. Hale and Norcross sold at $2.10. Sutro Tunnel was quiet and steady, selling from 16@15c.

The Leadville stocks were moderately dealt in and were steady. Amie was quiet and steady at 12@11c. Chrysolite was strong, under a small business, selling from $1.15@$1.30. Iron Silver was moderately dealt in at irregular prices; it sold from $3@$2.90. Leadville was quiet and steady at 45@43c. Little Chief was strong last Saturday at 60c., but sold through the week at 57@55c.; the stock was fairly dealt in. Little Pittsburg was strong, under a small business, selling from 50@60c. Climax sold at 6c.

The Bodie stocks were very quiet. Standard was steady, selling from $6.25@$6. Bulwer was steady, selling at 50c. Bodie sold to-day from 45@40c.

The Tuscarora stocks were quiet and steady. Grand Prize sold at 45@40c., with a small business. Belle Isle was quiet and steady at 43@40c. Navajo was strong, under a small business, selling from $4@$4 10. North Belle Isle sold at 65c. Elko Consolidated was quiet and steady, selling from 18@19c., assessment paid. Argenta sold at 22c.

In the miscellaneous list, Alice was moderately dealt in and was weak, selling from $2.80@$2.50. Bassick was quiet and steady, selling from $8.50@$9. Father de Smet sold at $3.50. Horn-Silver was fairly dealt in at weak prices; it sold from $6@$5@$5.25 dividend unpaid, and from $4.60@$4.90 dividend paid. Robinson Consolidated was quiet and irregular, selling from 48@43@46c. Sierra Grande sold from $1@96c. under a very small business. Castle Creek was strong, with moderate transactions, selling from $1.05@$1.20.

Barcelona was weak, under a small business, selling from 27@24c. Bradshaw was quiet at 22@21c. Caledonia was quiet and steady at 25@27c. Decatur was quite active at 4c. Eastern Oregon was active and steady, selling from 43@47c. Harlem was fairly dealt in at irregular prices; it sold from 94@98@96c. Hortense was quiet and steady at 10@11c. Lacrosse sold at 9c. and Rappahannock at 8c. Red Elephant sold from 6@5c. with small transactions. Sonora Consolidated was quiet and a little weak, selling from 28@25c.

At a meeting of the stockholders of the Chrysolite Silver Mining Company, held on Wednesday last at the office, No. 18 Wall street, this city, the following trustees were elected for the ensuing year: R. W. Raymond, H. A. V. Post, W. S. Gurnee, D. S. Appleton, Abram S. Hewitt, E. F. Bedell, J. F. Tams, C. S. Knowles, William Borden, Nicholas Rath, and R. H. Thurston.

A large array of counsel appeared last Monday before Judge Wallace, of the United States Circuit Court, and Judge Brown, of the United States District Court, who held court jointly, to argue motions for the removal of five suits against mining companies from the Federal to the State courts. The first case was that of Henry T. Cutter *against* Daniel S. Appleton, Charles A. Whittier, and others, and the Chrysolite Silver Mining Company; the second was that of Sylvester H. Langdon, Francis A. Fogg, Clinton B. Fisk, John S. Williams, James Clyne, Morris Seligman, and the Silver Era Mining Company; the third was that of Philip D. Jenkins *against* Charles Dennis, Hiram Dewing, Walter T. Hatch, and the Dunderberg Mining Company; the fourth was that of Eliphalet Nott and other stockholders *against* Henry Clews, John B. Alley, and others, and the Los Nueve Minas de Santa Maria Gold and Silver Mining Company; and the fifth was the case of George W. Boyd and other stockholders *against* Andrew W. Gill, Stephen B. Elkins, Augustus Ebert, Preston B. Plumb, William W. Macfarland, and the Amie Consolidated Mining Company. Decision was reserved in all cases.

MEETINGS.

The Animas Silver Mining Company, No. 35 Broadway, New York City. Annual meeting of stockholders and election of trustees, November 27th, at twelve o'clock M.

The Camuchin Consolidated Silver Mining Company, No. 35 Broadway, New York City. Annual meeting of stockholders and election of trustees, November 27th, at twelve o'clock M.

The Descubridora Consolidated Silver Mining Company, No. 35 Broadway, New York City. Annual meeting of stockholders and election of trustees, November 27th, at twelve o'clock M.

The South Yuba Water and Mining Company, No. 23 Nassau street, New York City. Annual meeting of stockholders and election of trustees, November 28th, at twelve o'clock M.

The Valenzuela Consolidated Silver Mining Company, 35 Broadway, New York City. Annual meeting of stockholders and election of trustees, November 27th, at twelve o'clock M.

DIVIDENDS.

The Plymouth Consolidated, of California, has declared its sixth dividend, amounting to $50,000; total dividends, $300,000.

DIVIDENDS PAID BY MINING COMPANIES DURING THE MONTH OF OCTOBER, AND FROM JANUARY 1ST, 1883.

| NAME OF COMPANY. | Location of mines. | Paid during month of October. | Since January 1, 1883. |
|---|---|---|---|
| Amie Consolidated, S.... | Colo. | $25,000 | $25,000 |
| Atlantic, C..... | Mich. | ..... | 80,000 |
| Bassick, S..... | Colo. | ..... | 200,000 |
| Black Bear, G..... | Cal. | ..... | 6,000 |
| Boston & Montana, G..... | Mont. | ..... | 10,000 |
| Bulwer Consolidated, G.. | Cal. | ..... | 35,000 |
| California, G..... | Colo. | ..... | 65,000 |
| Calumet & Hecla, C..... | Mich. | 500,000 | 2,000,000 |
| Carbonate Hill, S..... | Colo. | ..... | 60,000 |
| Castle Creek, G..... | Idaho. | 3,000 | 30,000 |
| Catalpa, S..... | Colo. | ..... | 30,000 |
| Central, C..... | Mich. | ..... | 60,000 |
| Christy, S. L..... | Utah. | ..... | 6,000 |
| Colorado United, S..... | Colo. | ..... | 16,750 |
| Contention, S..... | Ariz. | ..... | 375,000 |
| Con. Gold M. Co. of Ga.. | Ga. | ..... | 32,000 |
| Copper Queen, C..... | Ariz. | 125,000 | 500,000 |
| Cosmopolitan..... | Utah. | ..... | 50,000 |
| Crescent, S. L..... | " | 30.000 | 150,000 |
| Deadwood-Terra, G..... | Dak. | ..... | 20,000 |
| Dunkin, S..... | Colo. | 10.000 | 10,000 |
| Evening Star, S. L..... | " | ..... | 50,000 |
| Father de Smet, G..... | Dak. | 20.000 | 100.000 |
| Gem, S..... | Colo. | ..... | 7,500 |
| Glen, S..... | " | ..... | 3,000 |
| Granite, S..... | " | ..... | 3,750 |
| Hecla, S..... | Mont. | 15.000 | 150,000 |
| Henriett, S..... | Colo. | ..... | 27,000 |
| Holyoke, G..... | Idaho. | 4,000 | 40,000 |
| Homestake, G..... | Dak. | 25,000 | 475,000 |
| Hope, S..... | Mont. | 11.304 | 45,216 |
| Horn-Silver, S. L..... | Utah. | ..... | 900,000 |
| Howell S. & M. Co., G. S. L. | Ariz. | ..... | 3,750 |
| Idaho, G..... | Cal. | 3,100 | 72,850 |
| Indian Queen..... | Nev. | ..... | 3,750 |
| Indian Spring Drift..... | Cal. | ..... | 1,000 |
| Iron Silver, S L..... | Colo. | 100,000 | 300,000 |
| Jocuistita, S..... | Mexico. | ..... | 150,000 |
| Kentuck, S..... | Nev. | ..... | 21,000 |
| Leadville Consolidated, S. | Colo. | 20,000 | 60,000 |
| Lexington, S..... | Mont. | ..... | 200,000 |
| Little Chief, S..... | Colo. | 20,000 | 20,000 |
| Morning Star, S. L..... | " | 25,000 | 50,000 |
| Mount Pleasant, G..... | Cal. | ..... | 60,000 |
| Mount Diablo, S..... | Nev. | 12,500 | 37,000 |
| Navajo, G. S..... | Nev. | ..... | 125,000 |
| Northern Belle, S..... | " | ..... | 100,000 |
| Ontario, S. L..... | Utah. | 75.000 | 150,000 |
| Osceola Consolidated, C... | Mich. | 25,000 | 160,000 |
| Oxford, G..... | N. S. | ..... | 30,000 |
| Plymouth Cons, G..... | Cal. | 50,000 | 250,000 |
| Prussian, S. L..... | Colo. | ..... | 15,000 |
| Quincy, C..... | Mich. | ..... | 380,000 |
| Richmond, S. L..... | Nev. | ..... | 270,000 |
| San Francisco, C..... | Cal. | ..... | 2,500 |
| Shoshone, G..... | Idaho. | ..... | 6,000 |
| Sierra Buttes, G..... | Cal. | 5,625 | 11,250 |
| Sierra Grande, S..... | New Mex. | 100,000 | 500,000 |
| Silver Cord, G. S. L..... | Colo. | ..... | 180,000 |
| Silver King, S..... | Ariz. | ..... | 150,000 |
| Smuggler, S..... | Colo. | ..... | 36,000 |
| Standard Cons., G..... | Cal. | 25,000 | 250,000 |
| Total Wreck..... | Ariz. | ..... | 50,000 |
| True Fissure, G. S. L..... | Utah. | ..... | 75,000 |
| United Gregory, G..... | Colo. | ..... | 12,000 |
| | | $1,229,429 | $9,234,316 |

G., gold. S., silver. C., copper. L., lead. N., nickel. Q., quicksilver.

PIPE LINE CERTIFICATES.

The petroleum market up to to-day was absolutely featureless, the fluctuations being within a narrow range and the dealings of a limited character. To-day, however, a reaction set in, and the market was quite active at strong prices, closing at the highest figure for the day. There was no news from the oil-fields to affect the market either way, and the dealings were simply confined to the local traders.

The following table gives the quotations and sales at the New York Mining Stock and National Petroleum Exchange:

| | Opening. | Highest. | Lowest. | Closing. | Sales. |
|---|---|---|---|---|---|
| Nov. 3..... | $1.09¼ | $1.10⅜ | $1.09⅛ | $1.10⅜ | 2,990,000 |
| 5..... | 1.10⅜ | 1.10⅞ | 1.09⅞ | 1.09⅞ | 2,839,000 |
| 6..... | | | | | |
| 7..... | 1.09¾ | 1.10¼ | 1.09¾ | 1.09⅞ | 1,779,000 |
| 8..... | 1.10¼ | 1.10⅜ | 1.10 | 1.10 | 1,310,000 |
| 9..... | 1.10⅛ | 1.12⅛ | 1.09⅞ | 1.12⅛ | 3,727,000 |
| Total sales..... | | | | | 12.645,000 |

SAN FRANCISCO MINING STOCK QUOTATIONS.

*Daily Range of Prices for the Week.*

| NAME OF COMPANY. | CLOSING QUOTATIONS. Nov. 2. | Nov. 3. | Nov. 5. | Nov. 6. | Nov. 7. | Nov. 8. |
|---|---|---|---|---|---|---|
| Albion..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Alpha..... | 1¾ | 1⅞ | ..... | 1⅞ | 1⅝ | 1⅝ |
| Alta..... | 1⅜ | 1⅜ | 1½ | 1⅜ | 1⅜ | 1⅜ |
| Argenta..... | ..... | ..... | ..... | ..... | .20 | ..... |
| Bechtel..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Belcher..... | 1 | ..... | ..... | ..... | 1 | .90 |
| Belle Isle..... | ..... | .40 | .45 | ..... | .45 | ..... |
| Best & Belcher..... | 3¾ | 3⅞ | 3¾ | 3⅝ | 3½ | 3½ |
| Bodie..... | .40 | .35 | ..... | ..... | .25 | .30 |
| Bullion..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Bulwer..... | ..... | ..... | ..... | ..... | ..... | ..... |
| California..... | .25 | .25 | .25 | .25 | ..... | .25 |
| Challar..... | 2⅛ | 2¼ | 2¼ | 2 | 2⅛ | 2 |
| Con. Virginia..... | .50 | .50 | .50 | .45 | .45 | .45 |
| Crown Point..... | ..... | 1⅛ | 1⅛ | ..... | 1 | 1 |
| Elko Cons..... | ..... | ..... | ..... | ..... | .20 | .20 |
| Eureka Cons..... | 4⅜ | 4⅜ | 4½ | 4 | ..... | 4 |
| Exchequer..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Gould & Curry..... | 1⅞ | 1¾ | 1⅞ | 1¾ | 1⅝ | 1½ |
| Grand Prize..... | .55 | .50 | .45 | .40 | .30 | .25 |
| Hale & Norcross..... | 2 | 2⅛ | 2 | 1⅞ | 1¾ | 1¾ |
| Independence..... | .45 | .40 | ..... | .35 | ..... | ..... |
| Martin White..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Mexican..... | 3⅛ | 3¼ | 3¼ | 3 | 3 | 2¾ |
| Mono..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Mount Diablo..... | 4 | ..... | 4 | ..... | ..... | ..... |
| Navajo..... | 3¾ | 3¾ | 3¾ | 4 | ..... | 3⅞ |
| Northern Belle..... | 4¼ | 4¼ | 4 | ..... | 4 | ..... |
| North Belle Isle..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Ophir..... | 5⅝ | 5¾ | 5⅝ | 4¾ | 4 | 3½ |
| Overman..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Potosi..... | .85 | .80 | .85 | .75 | .75 | .70 |
| Savage..... | .85 | .85 | .80 | .60 | .65 | .70 |
| Scorpion..... | .50 | ..... | .50 | .50 | .55 | .50 |
| Sierra Nevada..... | 3¾ | 4 | 4 | 3⅞ | 3⅞ | 3⅞ |
| Silver King..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Tip Top..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Union Cons..... | 3⅝ | 3½ | 3¾ | 3½ | 3⅝ | 3½ |
| Utah..... | 1¾ | 1⅝ | 1¾ | 1⅝ | 1½ | 1⅝ |
| Wales Cons..... | ..... | ..... | ..... | ..... | ..... | ..... |
| Yellow Jacket..... | 3⅜ | 3½ | 3⅜ | 3 | 3½ | 3½ |

### Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

BOSTON, November 8.

There is no feature to report in regard to mining stocks for the past week. The market is dull and uninteresting, with very little doing and no incentive to speculation. Ingot copper holds quite steady at 15@15½c., and the market for producing mines, while quite limited, is nevertheless firm, and small lots for investment purposes are taken at current rates. Calumet & Hecla sold at $240, and is in firm demand at that price. Franklin declined from $11¾@$11 for a small lot, with later sales at $11½@$11¼ for regular stock, and $11¾ buyer 60. Quincy is unusually quiet; sales of 20 shares only reported for the week at $50; but $51 was bid for it to-day, without bringing out the stock. Pewabic advanced from $2½ (October 27th) to $3¼, at which price a small lot was sold to-day, and more is wanted at the same price. Osceola is very firm at $18½, with but little stock offered. A sale of 100 shares Allouez is reported at $1½, the last sale being September 26th, at the same price. The rest of the list is without any reported transactions.

The silver stocks continue dull, and, with the exception of Sullivan, almost without feature. Bonanza sold at $1½, same as before. Catalpa, dull at 27½c. Harshaw sold at 50c. Sullivan has been the most active stock on the list, and declined from 96@81¼c., with a subsequent rally later to 95c. The delinquent stock was sold at $1, 1900 shares being sold to pay the assessment of 25c. per share on 7600 shares defaulted. Bowman Silver declined to 10c.; this, for a stock on which assessments of 15c. per share have been paid within a year, offers but poor encouragement to stockholders. Empire declined to 25c. Massachusetts & New Mexico offered at 3c Dunkin, 23@26c.

3 P.M.—At the afternoon Boards, Catalpa sold at 27½@29c. Franklin, $11½. Closing prices: Atlantic, $10 bid, $11 asked. Bonanza, $1 7/16@$1¾. Calumet & Hecla, $240 asked. Huron, $1¼@$1¾. Osceola, $18@$18½. Pewabic, $3. Quincy, $51@$51¾. Silver Islet, $3½@$4. Sullivan, 92½@95c.

## BULLION MARKET.

NEW YORK, Friday Evening, Nov. 9.

Under a fall in the price of exchange on India, the silver market in London has receded somewhat, and affected the price here, as shown by the figures of the accompanying table:

| DATE | London. Pence. | N. Y Cents. | DATE. | London. Pence. | N. Y Cents. |
|---|---|---|---|---|---|
| Nov. 3 | 50 15-16 | 110½ | Nov. 7 | 50 13-16 | 110¼ |
| 5 | 50 15-16 | 110½ | 8 | 50 13-16 | 110¼ |
| 6 | 50⅝ | Holiday. | 9 | 50 13-16 | 110⅝ |

BULLION PRODUCTION FOR 1883.

We give below a statement showing the latest bullion shipments. These are officially obtained from the companies, where that is possible; and where official statements can not be procured, we take the latest shipments published in those papers nearest to the mines reported. The table gives the amount shipped for the week up to the date given, as well as the aggregate shipments to such date from the first of January, 1883.

The shipments of silver bullion are valued at $1.29·29 per ounce troy; gold at the standard $20.67 per ounce troy. The actual value of the silver in the following table is therefore subject to a discount, depending on the market price of silver. If the price of silver be counted at $1.11 an ounce, which has for some months been about its average value, the following figures, where they relate to silver bullion, should be diminished by about 14⅛ per cent, to arrive at actual value.

| MINES. | States. | Month of September. | Year from Jan. 1st, 1883. |
|---|---|---|---|
| *Alice, G. S. | Mont | $97,512 | $779,099 |
| *Alta-Montana, G. L. S. | " | | $10,625 |
| *Belmont | " | | 12,604 |
| Bodie, G. S. | Cal | 15,659 | 189,660 |
| Bodie Tunnel, G. | " | | 52,742 |
| *Bonanza King, G. | " | | 426,967 |
| *Boston & Montana, G. | Mont | 6,277 | 135,107 |
| *Central Arizona, S. | Ariz | | 35,845 |
| *Christy, S. | Utah | 20,981 | 201,715 |
| *Chrysolite, S. L. | Colo | 27,183 | 311,491 |
| *Consolidated Bobtail, G | Colo | | 47,986 |
| *Contention, S. | Ariz | 79,224 | 714,637 |
| Crescent, G. | Cal | | 13,000 |
| *Custer, G. S. | Idaho | | 43,572 |
| *Deadwood-Terra, G. | Dak | 51,960 | 335,340 |
| *Derbec Blue Gravel, G. S. | Cal | 14,097 | 102,579 |
| Dunkin, S. L. | Colo | 6,113 | 42,959 |
| Evening Star, S. L. | Colo | | 47,061 |
| *Father de Smet, G. | Dak | 32,286 | 270,876 |
| *Frisco M. and S. Co., G. S. L. | Utah | | $77,084 |
| *Granite Mountain, S. | Mont | 63,834 | 165,950 |
| Gunnell, S. | Colo | | 58,828 |
| *Haile, G., S., C. | S. C. | | 27,900 |
| *Head Center Consolidated | Ariz | 10,629 | 43,247 |
| *Head Center and Tranquillity | Ariz. | | 89,108 |
| *Hecla Consolidated, G. S. L. | Mont | **77,630 | 633,979 |
| *Homestake, G. | Dak. | 81,624 | 767,596 |
| *Hope, S. | Mont | 19,613 | 82,060 |
| Horn-Silver, S. L. | Utah | 303,000 | 2,474,200 |
| *Howell S. and Mg. Co., G. S. L. | Ariz | 23,769 | 114,289 |
| Idaho, G. | Cal | | 150,642 |
| *Independence, G. S. | Nev | | 32,991 |
| Iron Silver, S. L. | Colo | | 751,062 |
| *Jocuistita, S. | Mex | | ‡258,959 |
| *Kentuck, G. S. | Nev | 1,730 | 18,596 |
| *Lexington, S. | Mont | 111,005 | 967,708 |
| *Little Pittsburg, S. L. | Colo | 10,473 | 64,978 |
| *Marguerite, G. | Cal | 3,200 | 68,794 |
| *Martin White, G. S. | Nev | | 136,317 |
| Morning Star, S. D. | Colo | | 84,428 |
| *Moulton, G. S. | Mont | | 123,288 |
| Mount Diablo | Nev | 51,709 | 381,142 |
| *Navajo, G. S. | " | | 411,642 |
| *North Belle Isle | " | | 2,153 |
| Northern Belle, S. | " | 30,840 | 505,827 |
| *Ontario, S. L. | Utah | 185.8 14 | 1,595,378 |
| *Oxford, G. | N. S. | 4,910 | 50,175 |
| *Phœnix, G. | N. C. | 3.507 | 21,009 |
| *Pinal Consolidated, S. L. | Ariz | | 181,485 |
| *Plymouth Consolidated, G. | Cal | 68,864 | 296,082 |
| *Satemo, G. | N. S. | | 2,500 |
| *Silver Bow, G. S. | Mont | | 203,947 |
| *Silver Cord, G. S. L. | Colo | | 703,333 |
| Silver King, S. | Ariz | | 367,802 |
| *South Yuba, G. | Cal | 2,567 | 37,272 |
| Standard, G. | Cal | 95,878 | 875,222 |
| Star, S. | Nev | | 27,095 |
| *Stormont, S. | Utah | 17,646 | 193,791 |
| Syndicate, G. | Cal | 9,623 | 56,008 |
| Tintic M. and M. Co. | Utah | 5,554 | 34,670 |
| *Tip Top, S. | Ariz | | 87,868 |
| *Tombstone, G. S. L. | " | | 548,764 |
| Wyoming Consolidated | Cal | | 51,541 |
| Yellow Jacket, S. | Nev | | 265,885 |
| Total amount of shipments to date | | | $17,794,751 |

* Official. † Net value. ‡ Assay value. § Not including value of lead. *G. Gold. S. Silver. L. Lead.* The dash (——) indicates that no shipments have been made in the month named. ** Silver valued at $1.10 per ounce.

*Bullion Receipts at New York.*—The bullion received from the mines at the various offices in this city during the week ended November 9th, as compiled from various sources, amounted to $335,396, as against $247,000 reported for the previous week. The receipts from January 1st, 1883, to date are $9,898,448.

*Exports and Imports of Gold and Silver at New York.*

*Exports.*

| | |
|---|---|
| Week ended November 3d | $356,860 |
| Corresponding week last year | 117,844 |
| Since January 1st, 1883 | 12,685,819 |
| Corresponding period last year | 44,561,721 |

*Imports.*

| | |
|---|---|
| Week ended November 3d | $1,526,520 |
| Corresponding week last year | 447,712 |
| Since January 1st, 1883 | 15,668,367 |
| Corresponding period last year | 4,728,631 |

*Foreign Bank Statements.*—The governors of the Bank of England, at their regular weekly meeting, made no change in the bank's minimum rate for discount, and it remains at three per cent. During the week, the bank lost £15,000 bullion, but the proportion of its reserve to liabilities was raised from 43⅛ to 43⅝ per cent, against 37¼ per cent a year ago. The weekly statement of the Bank of France shows losses of 260,000 francs gold, and 2,144,000 francs silver.

*Coinage at the Philadelphia Mint.*—The coinage executed at the Mint in October aggregated 9,497,800 pieces, valued at $1,359,914.50. This amount was made up of 1,050,050 silver dollars, 50 half-dollars, 50 quarters, 1,410,050 dimes, 2,461,000 five-cent pieces, 300 three-cent pieces, and 4,576,300 one-cent pieces.

*United States Assay-Office at New York.*—Statement of business for the month ended October 31st, 1883:

| | | |
|---|---|---|
| Deposits of gold: | | |
| Foreign coin | $1,361,000 | |
| Foreign bullion | 858,000 | |
| United States bullion | 470,000 | |
| United States bullion (re-deposits) | 305,000 | |
| Jewelers' bars | 98,000 | |
| Refined gold | 347,000 | —$3,439,000 |
| Deposits of silver: | | |
| Jewelers' bars | 17,000 | |
| Foreign coin | 7,700 | |
| Foreign bullion | 33,000 | |
| United States bullion (contained in gold) | 11,500 | |
| United States bullion (re-deposits) | 4,200 | |
| Bullion, Arizona | 2,200 | |
| Colorado | 29,500 | |
| Dakota | 27,100 | |
| Idaho | 14,400 | |
| Lake Superior | 1,400 | |
| Montana | 130,700 | |
| Nevada | 1,700 | |
| New Mexico | 19,600 | |
| Utah | 86,600 | |
| Refined silver | 82,400 | — 469,000 |
| Total deposits | | $3,908.000 |
| Gold bars stamped | $1,977,091 | |
| Silver " | 518,378 | — 2,495,469 |

## METALS.

NEW YORK, Friday Evening, Nov. 9.

**Copper.**—It is reported now that the extension of the Lake contracts alluded to some time ago as carrying the deliveries up to the close of the year, are really brought down to the beginning of April, the amount involved being reported to be twenty millions of pounds. There is an elasticity about such engagements which does not inspire much confidence. There is one feature in connection with the deliveries which to some extent checks a movement which has had much significance during past two years. Much of the copper is delivered at Waterbury and other centers of the manufacturing trade. This, to some extent, hampers the exchange of other brands of copper for Lake.

During the week, Lake copper has sold at 14⅛c., though probably the quantity available at that price is very small. Larger blocks of Baltimore, aggregating 500,000 pounds, have been placed. We quote 14⅛@14⅝c., according to brand.

The advices from abroad are not encouraging, and, in spite of all that is said to the contrary, it is difficult to see how, as we have already contended, our own market can resist the influence. London cables to-day £60 15s. cash and £61 f. o. b. for Chili Bars, and £66@£67 for Best Selected.

**Tin.**—The market is dull and weak, under the pressure of late and prospective arrivals. There are now 400 tons on the dock, and 275 tons are due on Sunday. We quote 20c. for Straits, large lines, cash. England cables £90 to-day.

**Lead.**—Since our last, the market has been dull, sales not aggregating more than a few hundred tons at 4c. for Common and Refined. Lead could be bought at 3·95c. for Common, if any body could be got to make an offer at that figure. Buyers, however, are frightened rather than encouraged at every further concession. While on the whole, the situation, as we have repeatedly stated, warrants the low figure of 4c., it can not be denied that at the present moment there appears to be some special effort to depress prices below it. It looks as though somebody were at work trying to bring smelters to the conviction that they must accept lower figures. The manufacturing trade will be busy for the next four or six weeks, and for that time some support from that quarter may be looked to. How matters will shape after that period remains to be seen. Until then, we do not believe that the situation warrants any sustained downward movement.

Messrs. John Wahl & Co., of St. Louis, wire to us as follows to-day:

Our market has declined slowly since our last report, on sales of 250 tons of Refined at 3·75c. There is very little doing, the demand being only moderate, with quotations nominally 3.70c.

Messrs. Everett & Post, of Chicago, telegraph us to-day:

The market is flat and weak, sales not aggregating more than 700 tons at 3·75c. down to 3·70c., closing nominally at the latter figure.

Soft Spanish is cabled from London £11 12s. 6d.

**Spelter.**—This metal has not shown any symptoms of the improvement so confidently expected months ago. It is quiet at 4⅝@4⅞c. for Ordinary Domestic. London cables £15 17s. 6d.

**Antimony.**—This metal is slightly stronger.

## IRON MARKET REVIEW.

NEW YORK, Friday Evening, Nov. 9.

Mr. Edward J. Shriver, Secretary of the Metal Exchange, has the following returns:

One hundred and thirteen furnaces, all kinds—sixty-four in blast, forty-nine out of blast.

| All grades. | Stocks. Oct. 1. | Nov. 1. | Production. In Sept. | In Oct. |
|---|---|---|---|---|
| Anthracite | 23,979 | 22,550 | 11,880 | 13,557 |
| Bituminous | 30,235 | 28,888 | 19,967 | 23,020 |
| Charcoal | 20,635 | 20,606 | 7,396 | 8,124 |
| Grand total | 74,849 | 72,044 | 39,243 | 44,701 |

**American Pig.**—Inquiries are getting more numerous, and the conviction is gaining ground generally that, if we have not come down to "bed-rock" in all departments, we are very near the lowest prices. Consumers, on the other hand, do not show the slightest anxiety, and have no cause for it. During the week, sales have been fair at prices practically unchanged. Foundry iron remains $20@$22 for No. 1 and $19@$20 for No. 2, with Gray Forge at $17.50@$18.50 at tide-water. Bessemer pig is dull, and with the lower prices for rails, will not find buyers except at very close figures. We quote $20@$20.25. Spiegeleisen is quiet at $30 for 20 per cent.

At the Exchange, the following sales were recorded: To-day, 1,000 tons No. 1, March, at $20.50.

**Scotch Pig.**—There is very little to report, the situation remaining unchanged, with a light business and moderate supplies.

We quote ex ship and to arrive: Coltness, $23; Langloan, $23@$23.25; Summerlee, $22.50@$23; Eglinton, $20.50@$21; Glengarnock, $21.75@$22; Dalmellington, $20.75@$21.

At the Exchange, the following lower cable quotations were received to-day: Coltness, 55s. 6d.; Langloan, 54s. 6d.; Summerlee, 54s.; Gartsherrie, 53s.; Glengarnock, at Ardrossan, 48s.; and Eglinton, at Ardrossan, 46s. 9d. Warrants at the Exchange to-day were 44s. 1d.

**Rails.**—The wide publicity given to the open drop in the price of rails had brought out many inquiries and negotiations are now pending for the closing of several large contracts, and it is likely that in the next fortnight considerable orders will be placed, all of course for next year's delivery. Buyers generally appear to recognize the fact that the low prices are causing competition to narrow down, and it is believed that they will soon abandon all efforts to obtain further concessions.

**Old Rails.**—The market has shown little animation. We quote $21@$22 for Tees.

**Scrap.**—We quote $23 ex ship.

# NEW YORK MINING STOCKS.

## DIVIDEND-PAYING MINES.

| NAME AND LOCATION OF COMPANY. | HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE. | | | | | | | | | | | | SALES. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 3. | | Nov. 5. | | Nov. 6. | | Nov. 7. | | Nov. 8. | | Nov. 9. | | |
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Alice, Mon. | | | 2.80 | 2 65 | | | 2.75 | | 2.75 | 2.50 | | | 700 |
| Amie Con., Co. | 12 | .11 | .12 | | | | .12 | .11 | .11 | | | | 5,000 |
| Argenta, Ne. | | | | | | | | | | | .22 | | 100 |
| Bar. & Walker, Ut. | | | | | | | | | | | | | |
| Bassick, Co. | | | | | | | 9.00 | | | | 9.00 | 8.50 | 55 |
| Belle Isle, Ne. | | | | | | | .43 | .40 | | | .45 | .40 | 900 |
| Bodie Cons., Ca. | | | | | | | | | | | .45 | .40 | 100 |
| Breece, Co. | | | | | | | | | | | | | |
| Bulwer, Ca. | .50 | | | | | | | | .40 | | | | 110 |
| California, Ne. | | | | | | | .26 | .25 | | | | | 200 |
| Cal. & Hecla, Mich. | | | | | | | | | | | | | |
| Carbonate Hill | | | | | | | | | | | | | |
| Carbon Con., Co. | | | | | | | | | | | | | |
| Castle Creek | | | 1.10 | 1.05 | | | 1.20 | 1.19 | 1.20 | 1.15 | 1.20 | | 3,700 |
| Chrysolite, Co. | 1.20 | 1.15 | 1.20 | 1.15 | | | 1.20 | 1.15 | | | 1.30 | 1.25 | 6,650 |
| Cons. Va. Ne. | | | | | | | .48 | .46 | .47 | | .46 | .45 | 3,900 |
| Crown Point | | | | | | | | | | | | | |
| Deadwood-Terra, Dk. | | | | | | | | | | | | | |
| Dunkin, Co. | | | | | | | | | | | | | |
| Eureka Cons., Ne. | | | | | | | | | | | | | |
| Excelsior, Ca. | | | | | | | | | | | | | |
| Father de Smet, Dk. | | | | | | | 3 50 | | | | | | 200 |
| Findley, Ga. | | | | | | | | | | | | | |
| Gold Stripe, Ca. | .04 | | | | | | | | | | | | 300 |
| Gould & Curry, Ne. | | | | | | | | | | | | | |
| Grand Prize, Ne. | | | | | | | | | .45 | .40 | | | 700 |
| Great Eastern, Dk. | | | | | | | | | | | | | |
| Green Mountain, Ca. | | | | | | | | | | | | | |
| Hale & Norcross, Ne. | | | | | | | 2.10 | | | | | | 100 |
| Hall-Anderson, N. S. | | | | | | | | | | | | | |
| Hibernia, Co. | | | | | | | | | | | | | |
| Homestake, Dk. | | | | | | | | | | | | | |
| Horn-Silver, Ut. | 6.00 | 5.75 | 5.50 | 5.00 | | | 5.25 | | 4.60 | | 5.25 | 4.90 | 2,770 |
| Hukill, Co | | | | | | | | | | | | | |
| Independence, Ne. | | | | | | | | | | | | | |
| Iron Silver, Co. | 3.00 | 2.95 | 2.95 | | | | 2.95 | 2.90 | | | 2.95 | 2.90 | 2,950 |
| La Plata, Co. | | | | | | | | | | | | | |
| Leadville C., Co. | .45 | .43 | | | | | | | | | | | 1,300 |
| Little Chief, Co. | .60 | .56 | | | | | .57 | .56 | .56 | .55 | | | 4,800 |
| Little Pittsburg, Co. | .56 | .55 | .50 | | | | .60 | | | | | | 1,510 |
| Martin White, Ne. | | | | | | | | | | | | | |
| Moose, Co. | | | | | | | | | | | | | |
| Navajo, Ne. | 4.00 | | 4.05 | | | | 4.10 | | | | | | 300 |
| Northern Belle, Ne. | | | | | | | 4.25 | | | | | | 25 |
| North Belle Isle, Ne. | | | | | | | | | .65 | | | | 100 |
| Ontario, Ut | | | | | | | 31.00 | 30.00 | | | | | 125 |
| Opnir, Ne. | | | | | | | | | | | | | |
| Plumas, Ca. | | | | | | | | | | | | | |
| Prussian, Colo. | | | | | | | | | | | | | |
| Quicksilver Pref., Ca. | | | | | | | | | | | | | |
| " Com., Ca. | | | | | | | | | | | | | |
| Rising Sun, Ca. | | | | | | | | | | | | | |
| Robinson Cons., Co. | .48 | .44 | .46 | .45 | | | .47 | .43 | .45 | | .47 | .46 | 3,700 |
| Saint Joseph's Lead. | | | | | | | | | | | | | |
| Savage, Ne. | | | | | | | | | | | | | |
| Sierra Grande, N. M. | 1.00 | | 1.00 | .96 | | | | | | | | | 600 |
| Sierra Nevada, Ne. | 3.80 | | | | | | 3.75 | | 5.00 | | | | 160 |
| Silver King, Ar. | | | | | | | | | | | | | |
| Spring Valley, Ca. | | | | | | | | | | | | | |
| Standard, Ca. | 6 25 | | | | | | 6.00 | | 6 00 | | | | 3 0 |
| Stormont, Ut. | | | | | | | | | | | | | |
| Tip Top, Ar. | | | | | | | | | | | | | |
| Tombstone, Ar. | | | | | | | | | | | | | |
| Vizina, Ar. | | | | | | | | | | | | | |
| Yellow Jacket | | | | | | | | | | | | | |

## NON-DIVIDEND-PAYING MINES.

| NAME AND LOCATION OF COMPANY. | HIGHEST AND LOWEST PRICES PER SHARE AT WHICH SALES WERE MADE. | | | | | | | | | | | | SALES. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov. 3. | | Nov. 5. | | Nov. 6. | | Nov. 7. | | Nov. 8. | | Nov. 9 | | |
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Albion | | | | | | | | | | | | | |
| Alta-Montana | | | | | | | | | | | | | |
| Barcelona, G. | .27 | | .27 | | | | | | .25 | | .25 | | 2,400 |
| Bear Creek | | | | | | | | | | | | | |
| Bechtel Con., G. | | | | | | | | | | | | | |
| Belvidere | | | | | | | | | | | | | |
| Best & Belcher, G. S. | | | | | | | | | | | | | |
| Big Pittsburg, S. L. | | | | | | | | | | | | | |
| Bradshaw, S. | | | | | | | | | | | .22 | .21 | 200 |
| Buckeye | | | | | | | | | | | | | |
| " pref. | | | | | | | | | | | | | |
| Bull-Domingo, S.L. | | | | | | | | | | | | | |
| Bye and Bye | | | | | | | | | | | | | |
| Calaveras, G | | | | | | | | | | | | | |
| C'lav'r's W.&M.Co. | | | | | | | | | | | | | |
| Cal., B. H., G. | .25 | | .27 | | | | | | | | | | 3,000 |
| Central Ariz'na, S. | | | | | | | | | | | | | |
| Cherokee, G. | | | | | | | | | | | | | |
| Cholla | | | | | | | | | | | | | |
| Climax, Co. | .06 | | | | | | | | | | | | 100 |
| Cons. Imp'r'l, G.S. | | | | | | | | | | | | | |
| Cons. Pacific | | | | | | | | | | | | | |
| Crowell, G. | | | | | | | | | | | | | |
| Danlonega, G. | | | | | | | | | | | | | |
| Decatur | .04 | | .04 | | | | | | .04 | | .04 | | 11,700 |
| Dunderberg | | | | | | | | | | | | | |
| Durango, G. | | | | | | | | | | | .04 | | 500 |
| Eastern Oregon | .44 | .43 | .44 | .43 | | | | | .47 | .46 | .47 | .46 | 9,500 |
| Elko Cons. | .18 | | | | | | | | .18 | | .19 | | 4,900 |
| Enterprise | | | | | | | | | | | | | |
| Fannie Barret | | | | | | | | | | | | | |
| Globe Copper | | | | | | | | | | | | | |
| Gold Placer, G | | | | | | | | | | | | | |
| Goodshaw, G. | | | | | | | | | | | | | |
| Granville, G | | | | | | | | | | | | | |
| Hariem M.& M.Co. | .97 | .94 | .98 | .95 | | | | | .98 | .97 | .98 | .97 | 8,300 |
| Hortense, S | | | .10 | | | | | | | | .11 | | 500 |
| Imperial | | | | | | | | | | | | | |
| Lacrosse, G | | | | | | | | | .09 | | .09 | | 900 |
| Lucerne | | | | | | | | | | | | | |
| Mariposa Pref., G | | | | | | | | | | | | | |
| Com., G | | | | | | | | | | | | | |
| Mexican, G. S. | | | | | | | | | | | | | |
| Miner Boy | | | | | | | | | | | | | |
| Mono | | | | | | | | | | | | | |
| North Standard, G. | | | | | | | | | | | | | |
| N. Horn-Silv'r, S.L. | | | | | | | | | | | | | |
| Ori'nt'l & Miller, S. | | | | | | | | | | | | | |
| Parnell | | | | | | | | | | | | | |
| Quartz Creek | | | | | | | | | | | | | |
| Rappahannock, G. | | | | .08 | | | | | .08 | | | | 1,500 |
| Red Elephant, S. | | | | | | | | | .06 | | .05 | | 200 |
| Ruby, of Arizona | | | | | | | | | | | | | |
| Silver Cliff, S. | | | | | | | | | | | | | |
| Sonora Con. | .26 | | .28 | .26 | | | | | .26 | | .26 | .25 | .26 | .26 | 6,000 |
| South Bodie, G. | | | | | | | | | | | | | |
| South Bulwer, G. | | | | | | | | | | | | | |
| South Hite | | | | | | | | | | | | | |
| South Pacific | | | | | | | | | | | | | |
| State Line, 1 & 4, S. | | | | | | | | | | | | | |
| " Nos. 2 & 3, S. | | | | | | | | | | | | | |
| Sutro Tunnel | | | | | | | | | | | 16 | .15 | .16 | | .15 | | 5,000 |
| Taylor-Plumas | | | | | | | | | | | | | |
| Unadilla, S | | | | | | | | | | | | | .01 | | 1,000 |
| Union Cons., G. S. | | | | | | | | | | | | | |

Full tables giving the total amount of dividends, capital, etc., will be printed the first week of each month. Dividend shares sold, 41,36 5. Non-dividend shares sold, 56,3 0.

## BOSTON MINING STOCKS.

| | Nov. 2. | | Nov. 3. | | Nov. 5. | | Nov. 6. | | Nov. 7. | | Nov. 8. | | Sales |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Allouez | | | | | 1.50 | | | | | | | | 100 |
| Amie | | | | | .12 | | | | .12 | | | | 500 |
| Atlantic | | | | | | | | | | | | | |
| Aztec | | | | | | | | | | | | | |
| Bodie Con. | | | | | | | | | | | | | |
| Bonanza D. | 1.63 | | 1.50 | | 1.50 | | | | 1.63 | | | | 400 |
| Bowman Sil | .12 | .10 | .11 | | .10 | | | | .10 | | .11 | .10 | 8,200 |
| Bruns. Ant. | | | | | | | | | | | | | |
| Bulwer | | | | | | | | | | | | | |
| California | | | | | | | | | | | | | |
| Cal. & Hec. | | | 240 | | 240 | | | | | | 240 | | 22 |
| Catalpa | | | .27 | | .27½ | | | | | | .30 | .27½ | 1,750 |
| Co. Virginia | | | .55 | | | | | | | | | | 300 |
| Copper F'lls | | | | | | | | | | | | | |
| Crescent | | | | | | | | | | | | | |
| "Cusi" | | | | | | | | | | | | | |
| Decatur | | | | | | | | | | | | | |
| Deer Isle | | | | | | | | | | | | | |
| Denver City | | | | | | | | | | | | | |
| Douglas | | | | | | | | | | | | | |
| Duncan | | | | | | | | | | | | | |
| Dunkin | .26 | | .26 | | .26 | | | | | | | | 500 |
| Empire | .29 | .28 | .28 | .26 | .27 | .26 | | | | | .24 | | 4,400 |
| Franklin | | | .11 | | | | | | 11.50 | 11.25 | 11.50 | | 650 |
| Hancock G. | | | | | | | | | | | | | |
| Harshaw | | | | | | | | | | | .50 | | 300 |
| Horn-Silver | | | | | | | | | 5.25 | | | | 50 |
| Huron | | | | | | | | | | | | | |
| Independ'ce | | | | | | | | | | | | | |
| Indian Queen | | | | | | | | | | | | | |
| Mammoth | | | | | | | | | .01 | | | | 5,000 |
| Mass. & N.M. | | | | | | | | | | | | | |
| Milton | | | | | | | | | | | | | |
| Napa | | | | | | | | | | | | | |
| National | | | | | | | | | | | | | |
| Ontario | | | | | | | | | | | | | |
| Osceola | | | | | 18.50 | | | | 18.50 | | | | 22 |
| Penn-Breck. | | | | | | | | | | | | | |
| Pewabic | | | | | | | | | | | 3.25 | | 110 |
| Pine Tree | | | | | | | | | | | | | |
| Plymouth | | | | | | | | | | | | | |
| Quincy | | | 50.00 | | 50.00 | | | | | | | | 38 |
| Ridge | | | | | | | | | | | | | |
| Robinson | .45 | | | | | | | | | | .47 | | 300 |
| San Pedro | | | 17 | | | | | | .16 | | .16 | | 500 |
| S'ra Grande | | | | | | | | | | | | | |
| Silver Islet | | | | | | | | | | | | | |
| Silver King | | | | | | | | | | | | | |
| Simpson Gd | | | | | | | | | | | | | |
| Sonora Con | .28 | | | | | | | | | | | | 200 |
| South Paci. | | | | | | | | | | | | | |
| Standard | | | | | | | | | | | | | |
| Stewart | | | | | .14 | | | | | | | | 300 |
| Sullivan | .97½ | .82½ | .85 | | .90 | .81¼ | | | 1.02½ | .95 | .95 | | 8,100 |
| Sutro Tun. | | | | | .16 | | | | | | | | 300 |
| Sycamore | | | | | | | | | | | | | |
| Twin Lead. | | | | | | | | | | | | | |
| Vizina | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

## PHILADELPHIA MINING STOCKS.

| | Nov. 2. | | Nov. 3. | | Nov. 5. | | Nov. 6. | | Nov. 7. | | Nov. 8. | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Amer. Cons. | | | | | | | | | | | | | |
| Argent | .23 | .22 | .23 | .22 | .21 | | | | | | .22 | | 4,900 |
| Arizona So. | | | | | | | | | | | | | |
| Battle Mt. | | | | | | | | | | | | | |
| Buena | | | | | | | | | | | | | |
| California | | | | | | | | | | | | | |
| Calista | | | | | | | | | | | | | |
| Chrysolite | | | | | | | | | | | | | |
| Cincinnati | .09 | | .09 | | .09 | | | | | | | | 7,500 |
| Comprom'e | .15 | .10 | .15 | | | | | | | | | | 3,900 |
| Contention | | | | | | | | | | | | | |
| Con. Virg. | | | | | | | | | | | | | |
| Dauntless | | | | | | | | | | | | | |
| Del Monte | | | | | | | | | | | | | |
| Denver City | | | .19 | .18 | .18 | .17 | | | .18 | | | | 5,300 |
| Eureka | | | | | | | | | | | | | |
| Girard | | | | | | | | | | | | | |
| Governor | | | | | | | | | .03 | | | | 1,000 |
| Grand Uni'n | | | | | .03 | | | | | | | | 2,600 |
| Green Mt | | | | | | | | | | | | | |
| Gunnison | | | | | .19 | .18 | | | | | .19 | | 1,200 |
| Homestake | | | | | | | | | | | | | |
| Horn Silver | | | | | | | | | | | | | |
| Iowa Gulch | | | .04 | | .04 | .03 | | | .04 | | .04 | .03 | 18,500 |
| Iron Silver | | | | | | | | | | | | | |
| King Bul'on | | | | | | | | | | | | | |
| Ledger Con. | | | | | | | | | | | | | |
| Little Dia'd. | | | | | | | | | | | | | |
| Little Matd | | | | | | | | | | | | | |
| Little Pitts. | | | | | | | | | | | | | |
| L'g & D'y H | | | | | | | | | | | | | |
| Montana | | | | | | | | | | | | | |
| Mt. Sheridan | | | | | .02 | | | | | | | | 500 |
| Navajo | | | | | | | | | | | | | |
| North'n B'l. | | | | | | | | | | | | | |
| Orion | | | | | | | | | | | | | |
| Orion Pref. | | | | | | | | | | | | | |
| Palmetto E. | | | | | | | | | | | | | |
| Pembina | .10 | | | | | | | | | | | | 1,000 |
| Penn-Breck. | | | | | | | | | | | | | |
| Permanent | | | | | | | | | | | | | |
| Pizarro | | | | | | | | | | | | | |
| Pizarro Ex. | | | | | | | | | | | | | |
| Potosi | | | | | | | | | | | | | |
| Rara Avis | .09 | | | | | | | | | | .08 | | .09 | | 4,200 |
| Rara Avis E. | .07 | | | | | | | | | | | | | | 1,100 |
| Record | | | | | | | | | | | | | |
| Rico Pion'r | | | | | | | | | | | | | |
| Sierra Apac. | | | | | | | | | | | | | |
| Sierra Bella | | | | | | | | | | | | | |
| Sierra G'nde | 1.00 | | 1.00 | | .95 | .90 | | | | | | | .97½ | .95 | 8,950 |
| Sierra Nev. | | | | | | | | | | | | | |
| Silver Cord | | | | | | | | | | | | | |
| Silver King | | | | | | | | | | | | | |
| Silv'r Plume | | | | | | | | | | | | | |
| Sonora Con. | | | | | | | | | | | | | |
| Standard | | | | | | | | | | | | | |
| Sultana | | | | | | | | | | | | | |
| Sutro Tun'l. | | | | | | | | | | | | | |
| Tombstone | | | | | | | | | | | .80 | | 100 |
| Victor | | | | | | | | | | | | | |
| Yale Mt | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

**Philadelphia.** November 9.

The views of leading iron men as to the future of the market are but little more hopeful than two or three weeks ago. Rumors are afloat as to further concessions and shading of prices from figures which have heretofore been considered bottom prices. This has had an unsettling effect upon those who were about ready to order stocks for the rest of the year; and it has also arrested the tendency to speculate in standard irons which was developed a few days ago by offers for large lots. At present writing, the outlook is unfavorable to any improvement, either in demand or prices. Foundry irons are selling very slowly. Prices for ordinary are as low as $20, while $20.50@$21 is quoted and paid for some of the better brands, with some small sales at $21.50. No. 2 has sold as low as $18.50, and the highest heard of this week was $19.50. About $19 represents the average, at which only small lots have sold. The leading makers consider the situation encouraging, but have no business or inquiries to justify their opinion. Millmen are looking up large lots of Forge, and White and Mottled have sold at $16.50@$17 delivered. Straight Forge, $17.50@$18.50. Most of the business is in from 50 to 100-ton lots, with a few contracts for larger lots for delivery this and next month. The improvement expected will be delayed still longer. Too many offerings are on the market for firm prices, and more stock is at furnace-banks than can be readily moved, and sellers are more urgent than buyers. Some of the stronger companies are putting a good face upon the market, and report active business probable for the future; but it must be admitted that the trade is without evidences of activity, beyond that necessitated by current requirements.

*Foreign Irons.*—Several offers for Bessemer and spiegeleisen have been withdrawn. For Bessemer, $20 50 is asked, and $30.50 for Spiegeleisen.

*Muck Bars.*—A further weakness of 50 cents is to be reported; sales have been made at $33, though some makes are held at $33.50.

*Blooms.*—Sales of Blooms have been made as low as $55 and $45, but some makes are higher.

*Manufactured Iron.*—Prices are weak, and sales have been made at 1·80c. for what passes as Refined. Very low prices are taken, in competition with Western mills. Eastern dealers prefer to pay $\frac{1}{10}$c. more for home iron, especially small buyers. Very little iron sells above 2c. Manufacturers are loath to admit that prices are declining and demand likely to continue as it is, but the indications all point that way. Two or three have received fair orders this week, but reports, especially from the country mills, are unfavorable, and show a positively declining tendency.

*Plate and Tank Iron.*—Mills on Plate and Tank iron are doing fairly, and taking orders for the first quarter of next year in some cases at 2·40@2·50c. for Common Plate and 3¾c. for Shell in small lots. Inquiries for flange and fire-box have come to hand this week. Locomotive requirements are active and steady. The ship-yards are consuming sufficient to impart a fair activity to the trade.

*Structural Iron.*—Two or three large specifications have arrived, and reports from the bridge-works continue as favorable as heretofore. Definite information can not be given at present as to the probable transactions for this and next month, but there is a good deal of work yet to be done. Angles, 2·40@2·50c., Tees, 2·75@3c. Beams and Channels, 3·40@3·50c. These figures have been shaded in reply to this week's inquiries.

*Wrought Pipes and Tubes.*—Mills on pipes and tubes are busy, and negotiations are about closing for large lots of pipe iron.

*Steel.*—An improving demand for low-grade steels is reported, in consequence of heavy shadings offered.

*Steel Rails.*—The action of the Scranton people has prevented the closing of some negotiations which were in hand a week ago. Small lots have been ordered at $37, but no large transactions are likely to take place at present, although it is dangerous to accept statements as to future intentions. Manufacturers will probably find it necessary to meet the drop half way. Several large lots are in negotiation.

*Old Rails.*—$23.50 is asked for Foreign and American Tees. Bridge rails nominal. Double-Heads, $25.50

*Scrap.*—$24.50@$25 is quoted for No. 1 and $18.50 @$22 for No. 2. Cargo, $23, nominal.

**Pittsburg.** November 7.

Pig-iron is in moderate demand at prices lower than have been reported for a long time. Buyers are still refusing to anticipate requirements, hoping and believing that lower prices will be reached; but furnace men say that they will be compelled to blow out if any further decline takes place, prices now being almost, and in a few cases quite, down to cost of production. C. B. Charcoal has sold at $30, and Warm Blast at $28. Red Short, $20 cash; standard brands of Neutral Forge, $17.50@$18. Muck Bars are dull and have declined to $32.50. For manufactured iron, 1·80@1·90c. is quoted. The market is weak and the demand dull except for small lots for immediate use. It is still uncertain whether the Nail Association will order a suspension, or agree to continue production. Stocks of nails are not large, but the demand is dull and prices weak, and it is thought that a suspension of the 2500 nail-machines will soon give the market a better tone. Mills on wrought iron pipe are fully employed, and the demand is active, although there is a great deal of complaint as to prices. Discounts on gas and steam-pipe, from 73 to 75 per cent off; boiler tubes, 60 per cent off. Old Rails are selling at $24 50. Steel Rails, $37.50@$38 for fall and $36 for next year's delivery, with moderate sales reported. Merchant steel is without improvement, and prices continue low. Quotations for railroad track supplies are unchanged, and the demand is moderate. Scrap, $21@$23 for No. 1.

## COAL TRADE REVIEW.

NEW YORK, Friday Evening, Nov. 9.

### Anthracite.

If any thing, the situation in our local market has grown worse, and there is almost a complete stagnation. Buyers, who had been assured months ago when they were stocking up heavily that their interests would be taken care of, are disgusted with the turn of affairs, and enter the market only when absolute necessity compels them to. The great majority of them by far prefer to deliver from accumulated stocks, letting them run down slightly, than keep their supplies up as is usual at this season. In spite of the fact that the West is taking more coal, that the Southern markets have absorbed more anthracite than usual, there is an excess of coal here, and the attitude of buyers makes the situation all the worse. Concessions are the rule, and yet it is difficult to place coal. Besides, the falling off in prices demoralizes that part of the trade, a heavy part of it, which consists in deliveries on contracts.

There is absolutely no hope that there will be a restriction of output this month; not because the state of the trade does not demand it, but for another reason. The beginning of December, however, will have to witness a stoppage, not alone of half time, but for at least a week. Prices are lower, $4.15@$4.20 for stove coal.

### Bituminous.

The Philadelphia correspondent of *Coal* says: The total production sent to Eastern markets for the year is 4,088,196 tons—an increase of 510,272 tons over the production for last year. The figures for last week are 107,732 tons. The Clearfield output was 57,455 tons; Broad Top, 13,048 tons. The smaller operators still complain of the lack of cars, but some of them have recently received more than during September. There is a disposition shown to meet trade requirements as far as possible, but the necessities of some shippers would lead them to precipitate more coal on the market than is needed, could they be as liberally supplied with cars as they desire. The company is endeavoring to serve the interests of both producers and consumers to a certain extent, and at the same time to profit by the heavy traffic. The shipments from the Cumberland region for the week are 57,043 tons, and for the year, 2,086,936 tons, or double those of last year.

### Buffalo.

The bituminous coal trade of Port Arthur, L. S., has already reached a considerable magnitude. Last year, 5000 tons were received at that port (the only port of entry in Manitoba), and this year the aggregate may exceed 90,000 tons, including 12,000 tons of anthracite, which is quoted at $13@$14 per ton at retail. From the want of proper shipping facilities in the way of handling soft coal at this point, the bulk of the movement has been from upper Lake Ports. Railroad freights also ruled too high from the mines to Buffalo. The cost of handling soft coal in Buffalo from cars to vessels by wheelbarrows is about thirty cents per ton; at Cleveland and Sandusky, where they have derricks, only from ten to twelve cents. The firm here which has contracts with the Canada Pacific Railroad expects to send 200,000 tons to Port Arthur next year and to use its own coal instead of purchasing from the producers. The firm will erect derricks and all conveniences at this port if possible before the opening of next season's business.

### Chicago.

Reports of new discoveries of soft coal in the territory tributary to Chicago are constantly coming in, and it would seem as if the whole Western country were underlain by some kind of coal, better or worse in quality. Portage County, Wisconsin, is happy over the discovery of a vein of coal of fair quality, while a rich vein of excellent quality has been found the past week at Manning, Carroll County, Iowa. A company with $200,000 capital has been formed to work the newly discovered mines at Victoria, five miles north of Bismarck, on the Northern Pacific road. A Canadian geologist who has just returned from a tour over the Canadian Pacific Railroad, reports that he has found indications of abundant coal—on the plains lignite, on the foot-hills bituminous, and in the mountains anthracite of fair quality. There are reports of other discoveries, too numerous for mention, constantly coming in, many of which of course amount to nothing.

### Cleveland.

The latest from the "new find" seems to establish my statement of two weeks ago. From samples of the drillings sent to Professor Orton, he declares it to be bituminous shale or albertite, containing about 50 per cent of fixed carbon. From the reputation of the men and the witnesses present at the drilling, I am satisfied it is an honest find, so far as they are concerned, and therefore not "salted," as some have charged; but as to the quantity or value of the "find," the presumption is against its being of any considerable dimensions, and its positive value can only be learned by sinking additional holes by a more systematic method, which will probably be done, as the quantity is evidently greater than any heretofore struck in this region.

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